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POLITY AND GOVERNANCE

Paper II: This section is relevant to Polity and Governance Section of GS Paper II

1.1 CONTEMPT OF COURT

Why in News: The Supreme Court (SC) of India recently warns that continued malicious attacks against the judges and judiciary cannot escape the rigour of punishment under the contempt of court law by tendering an apology.

Constitutional Provision

Article 129 of the Constitution of India (Article 215 for the High Courts) lays down that the Supreme Court shall be a court of record. As a court of record, the SC has two powers:

- The judgements, proceedings and acts of the SC are recognised (for perpetual memory and testimony) as legal precedents and legal references and cannot be questioned when produced before any court.
- The SC has power to punish for contempt of court.

- The SC (in 1991) ruled that it has power to punish for contempt not only of itself but also of high courts, subordinate courts and tribunals functioning in the entire country.
- Though the Constitution of India enlists the provision of 'contempt of court', it does not define the expression 'contempt of court'.

The Contempt of Courts Act, 1971:

- The Indian Parliament framed the Contempt of Courts Act, 1971, laying down procedure and punishment.
- The Act defines 'contempt' as an offence of showing disrespect to the dignity or authority of a court.

The Act further classified the contempt of court into civil and criminal.

Civil contempt means willful disobedience of any judgment, decree, direction, order, writ or other process of a court, or willful breach of an undertaking given to a court.

Criminal contempt, on the other hand, is attracted by the publication (whether by words, spoken or written, or by signs, or by visible representations) of any matter or the doing of any other act which:

- Scandalises or tends to scandalise, or lowers or tends to lower the authority of any court.
- Prejudices, or interferes or tends to interfere with the due course of any judicial proceeding.

- Interferes or tends to interfere with, or obstructs or tends to obstruct, the administration of justice in any other manner.

In 2006, the government introduced an amendment that now provides 'truth' as defence, if it is bona fide (genuinely true) and in the public interest.

Punishment for contempt of court: According to the Act, contempt of court may be punished with simple imprisonment for a term which may extend to six months, or with fine which may extend to Rs 2000, or with both.

The accused may be discharged or the punishment awarded may be remitted, if s/he tenders an apology (being made to the satisfaction of the court).

Limitation: The Act provides that no court shall initiate any proceedings of contempt (either on its own motion or otherwise), after the expiry of a period of one year from the date on which the contempt is alleged to have been committed.

News Update

- The judgment came as the court held a persistent Public Interest Litigation (PIL) litigant guilty of contempt of court. The contempt proceedings were initiated after the PIL litigant failed to deposit the penalty of ₹25 lakh imposed on him for filing about a dozen frivolous petitions and leveling accusations against the sitting and retired judges of the court.
- The court gave the PIL litigant several opportunities to deposit the fine and tender an unconditional apology, before announcing the punishment.

Ruling of the SC

- **The purpose of contempt jurisdiction**: It is to maintain the dignity of the institution of judicial forums and it is not a revengeful exercise.
- Power to punish for contempt is a constitutional power:
  - The SC held (while drawing a distinction between Articles 142 and 129) that the power to punish for contempt is a constitutional power vested in this court which cannot be abridged or taken away even by legislative enactment.
  - **Article 142 (2)** states that subject to the provisions of any law made in this behalf by Parliament the SC shall have all and every power to make any order on punishment of any contempt of itself.
  - **The comparison of Articles 129 and 142 shows that, while Article 142 (2)** could be subject to any law made by the Parliament, there is no such restriction as far as Article 129 is concerned.

An apology cannot be a defence: An apology can be accepted only if it does not compromise the dignity of the court and motivated and calculated attempts to reduce the image of the judiciary and to impede the administration of justice must be punished with contempt.

1.2 AMRUT 2.0

Why in News: PM Modi has launched Atal Mission for Rejuvenation and Urban Transformation 2.0. This flagship scheme of the central government is aimed at making all of India's cities water secure.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

- AMRUT was launched in 2015 to provide basic civic amenities like water supply, sewerage, urban transport, parks as to improve the quality of life for all especially the poor and the disadvantaged.
- The focus of the Mission is on infrastructure creation that has a direct link to provision of better services to the citizens.

ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION

Key Features

- Water Supply
- Pedestrian, non-motorized and public transport facilities, parking spaces
- Sewerage facilities and Septage management
- Creating and upgrading green spaces, parks and recreation centres
- Storm Water drains to reduce flooding

Objective

The objective of the mission is to

- Ensure that every household has access to a tap with assured supply of water and a sewerage connection
- Increase the amenity value of cities by developing greenery and well-maintained open spaces e.g. parks and
- Reduce pollution by switching to public transport or constructing facilities for non-motorized transport e.g. walking and cycling.

Coverage

- The Mission covers covering 500 cities that include all cities and towns with a population of over one lakh with notified Municipalities.
- AMRUT has been ensuring water security by adding 1.1 crore household water tap connections and 85 lakh sewer connections, thus benefiting more than 4 crore people.

AMRUT 2.0

The target in the second phase of AMRUT is to:

- Improve sewage and septic management
- Make our cities water safe cities and
- Ensure that no sewage drains anywhere in our rivers

In other words, AMRUT 2.0 will focus on enhancing sewerage and septic management and to make all Indian cities water secure.

Amrut 2.0 aims at

- Providing 100% coverage of water supply to all households in around 4,700 urban local bodies by providing about 2.68 crore tap connections and
- 100%coverage of sewerage and septage in 500 AMRUT cities by providing around 2.64 crore sewer or septage connections
- The outlay of AMRUT 2.0 is around ₹2.87 lakh crore.

Principles and Mechanism

- AMRUT 2.0 will adopt the principles of circular economy and promote conservation and rejuvenation of surface and groundwater bodies.
- The Mission will promote data led governance in water management and Technology Sub-Mission to leverage latest global technologies and skills.
- 'Pey Jal Survekshan' will be conducted to promote progressive competition among cities.

Coverage

- The Amrut 2.0 will extend coverage from 500 cities under the first phase to 4,700 cities and towns.
- It will provide water tap connections to 26.8 million urban households.
- It will benefit more than 10.5 crore people in urban areas.

1.3 ELECTION SYMBOL

Why in News: Recently, the Election Commission of India (ECI) has suspended the election symbol of the Lok Janshakti Party (LJP). As a result, neither of the two factions of the LJP will be permitted to use the name of the party and the party's election symbol in the coming Bihar Assembly bye elections.

This provides us the context to study the allotment of symbols to parties in case of a split.

Arrangement before 1968

- Then, under the Conduct of Election Rules, 1961, the ECI issued notifications and executive orders.
- Procedure followed by the ECI - Case of Communist Party of India's (CPI) split in 1964:
    - A splinter group approached the ECI urging it to recognize them as CPI (Marxist).
    - The splinter group provided a list of MPs and MLAs who supported them.
    - The ECI recognised the faction as CPI (M) after it found that the votes secured by the MPs and MLAs supporting the splinter group constituted more than 4% in the 3 states.

Arrangement after 1968: The current practice

The Election Symbols (Reservation and Allotment) Order, 1968: It enables the ECI to recognize political parties and allocate symbols and decide (under Paragraph 15 of the Order) disputes between rival factions (within the parent party) of a recognised political party that claim its name and symbol.

Authority of ECI in this regard

- As per the Symbol Order, 1968, the ECI is the only authority to decide issues on a dispute or a merger.
- In a verdict (Sadiq Ali vs. ECI in 1971), the Supreme Court (SC) of India upheld the validity Paragraph 15 of the Order, giving such powers to the ECI.

Procedure followed: In case of a recognised national and state parties (like the LJP) the procedure to be followed by the ECI:

- **Recognizing one group as the official party:** The ECI primarily ascertains the support enjoyed by a claimant within a political party in its:
    Organizational wing: By identifying how many office-bearers, members or delegates support the rival claimants.
    Legislative wing: By the number of MPs and MLAs in the rival camps.

Decision of ECI after a definite finding

- The ECI may give a decision in favour of one faction by holding that it commands enough support in its organisational and legislative wings.
- The same faction will be entitled to the name and symbol of the recognised party.

Group that doesn't get the parent party's name and symbol:

- Up to 1997: The ECI recognised both the factions. For example, the Congress (O) as well as the breakaway faction during the 1969 split.
- After 1997: Under a new rule, introduced by the ECI, the splinter group had to register itself as a separate party and could be recognised as the national or state party status on the basis of its electoral performance.

- **If there is no certainty:** If it is not possible to say with certainty which group has a majority, the ECI may suspend the party's symbol and allow the groups to register themselves with new names or add prefixes or suffixes to the party's existing names.

- **Time taken to decide the dispute:** For immediate electoral purposes, the ECI may suspend the party's symbol and advise the groups to fight the elections in different names and on temporary symbols (as the ECI may take time to decide the dispute).

- **If rival factions settle their differences and reunite**: They may approach the ECI again and seek to be recognised as a unified party. The ECI is empowered to restore the symbol and name of the original party.

- **Splits in registered but un-recognised parties:** In such cases, the ECI usually advises the rival factions to resolve their differences internally or to approach the court.

Example of Symbol allotment after parties split:

- The first case decided under the 1968 Order was the first split in the Indian National Congress in 1969.
- The party splitted into the "old" Congress (O) led by Nijalingappa and the "new" Congress (I) led by Indira.
- The "old" Congress retained the party symbol, while the breakaway faction was given a new symbol.
- In recent years, two other major cases of party split (Samajwadi Party and AIADMK in 2017) followed by the election symbol tussle have been noticed.

1.4 LATERAL ENTRY

Why in News: Recently, the Department of Personnel and Training announced the selection of 31 specialists as joint secretaries, directors and deputy secretaries in various Central Government departments.

Permanent System of Administrators

- In the permanent system, IAS officers get promoted to joint secretary level after 17 years of service and remain at that level for ten years.
- Joint Secretaries are at a crucial level of senior management in the Government of India and lead policymaking as well as the implementation of various programs and schemes for the department assigned to them.
- The joint secretary-level is usually filled by officers selected through the Civil Services Examination conducted by Union Public Service Commission.
- The IAS and permanent system are strictly seniority-bound nobody gets promoted ahead of time. That makes the average age of a joint secretary around 45.

Lateral Entry into Administration

- Lateral entry in administration is the appointment of specialists from the private sector in government organisations.
- It was recommended by the NITI Aayog in its Three-year Action Agenda and alsothe Group of Secretaries (GoS) on Governance had in its report recommended the induction of personnel in the middle and senior management level in the government.

Objective: Lateral entry was introduced to serve the twin purpose of:

- Bringing in domain expertise in the civil services,
- Addressing the problem of shortage of IAS officers at the Centre.

With lateral entry, the government aims to recruit outstanding individuals, with expertise in revenue, financial services, economic affairs, agriculture, cooperation and farmers' welfare, road transport and highway, civil aviation, commerce among many other sectors to serve for the benefit of the country.

Advantages of Lateral Entry

- **Need for Specialized Knowledge:** Governance is becoming more and more complex requiring specialized skills. For example, increasing penetration of data dominance in our lives.
  - Generalist officers cannot be always expected to be up-to-date with specialized knowledge. Therefore, people with expertise and specialist domain knowledge are required to navigate the complex needs of present-day administrative challenges.
- **Filling The Gap:** According to Department of Personnel and Training data, there is a shortage of about 1500 IAS officers. Lateral entry can help bridge this deficit.

- **Bringing a Change in Work Culture:** It will help in bringing change in bureaucratic culture in Government sector culture. This bureaucratic culture is criticized for red-tapism, rule-book bureaucracy, and status-quoist.
  - Lateral Entry helps in bringing the values of economy, efficiency, and effectiveness in the Government sector. It will help in building a culture of performance within the Government sector.
- **Participatory Governance:** Presently, governance is becoming a more participatory and multi-actor endeavor. In this context, the lateral entry provides stakeholders such as the private sector and non-profits an opportunity to participate in the governance process.

Arguments against Lateral Entry

- **Outsourcing Expertise:** There is a difference between bringing expertise and being part of the decision-making process. For bringing expertise, the government doesn't strictly need to hire private-sector personnel. Expertise is widely available and used by almost every ministry expert committees, consultations, think tank engagements, etc.
- **Cumbersome Decision-Making Process**: The success of lateral entry requires an understanding of the system and an ability to work with the "permanent" establishment. No training or orientation is provided for this.
  By the time networks are built, it is time to move on. On past evidence, the lateral entrants who made the biggest impact are those who served in the system for a length of time and at different levels
- **Profit Motive vs. Public Service:** Private sector approach is profit-oriented on the other hand motive of the Government is public service. This is also a fundamental transition that a private sector person has to make while working in government.
- **Conflict of Interest:** Hiring of the private sector into administrative positions raises issues of potential conflict of interest. This issue requires a stringent code of conduct for entrants from private sectors to ensure conflict of interest is not detrimental to the public good.

Process of Lateral Entry Recruitment

- The selection process for lateral entry into administration is conducted by the Union Public Service Commission (UPSC).
- The Department of Personnel and Training (DoPT) asks the UPSC to conduct the selection process for lateral entry to various positions in government departments and ministries.
- Subsequently, the UPSC invites online applications for lateral recruitment for these positions.

- Once the candidates have submitted their application, the UPSC conducts interviews of the shortlisted candidates and recommends the list of selected candidates to the DoPT.
- The recommended candidates are then appointed by the Government, generally for a period of 3 to 5 years.

News Update

Continuing the policy of inducting domain expertise from private sector in governance, the government has recently selected 31 specialists as joint secretaries, directors and deputy secretaries in Central government departments. Those selected include 3 joint secretaries, 19 directors and 9 deputy secretaries. Earlier, in April 2019, the Central government had appointed 9 non-governmental professionals as joint secretaries in different departments and ministries.

Lateral entry, like competition in any sphere, is a good thing. But serious thinking is required on entry requirements, job assignments, and number of personnel, and training to make it a force for positive change. Apart from it, reforms of the "permanent" system particularly its seniority principle — are also a prerequisite for holistic administrative reforms.

1.5 PARLIAMENT STANDING COMMITTEES

Why in News: Recently, the Lok Sabha Speaker and the Rajya Sabha Chairman reconstituted Department-related parliamentary standing committees.

Parliamentary Committees

The Parliament of India is too unmanageable to effectively consider the issues it is confronted with. Parliament's roles are diverse, complex and comprehensive and it does not have the suitable time or expertise to provide a complete scrutiny on legislative or other matters. That's why a variety of committees assist Parliament in the discharge of its duties.

Meaning

These committees are mentioned in the Constitution of India, although without providing specific provisions regarding their composition, tenure, functions, etc. All these matters are dealt with by the rules of two Houses. The Council of States (Rajya Sabha) and the House of the People (Lok Sabha). Hence, a parliamentary committee means a committee:

- That Is appointed or elected by the House or nominated by the Speaker (Lok Sabha) or Chairman (Rajya Sabha).

- Works under the direction of the Speaker or Chairman.
- Presents its report to the House or to the Speaker or Chairman.
- Has a secretariat provided by the Lok Sabha or Rajya Sabha.

Classification: In general, there are two types of parliamentary committees:

Standing Committees (permanent- constituted every year or periodically) and Ad Hoc Committees (temporary - cease to exist on completion of the task assigned to them).

Standing Committees: Based on the nature of the function of the Standing Committees, the following six categories may be characterized:

- Financial Committees such as the Public Accounts Committee.
- Departmental-related Parliamentary Standing Committees.
- Committees to Inquire such as the Committee on Petitions.
- Committees to Scrutinize and Control such as the Committee on Government Assurances.
- Committees Relating to the Day-to-Day Business of the House such as the Business Advisory Committee
- House-Keeping Committees or Service Committees (concerned with the provision of facilities and services to the Members of Parliament (MP)) such as the General Purposes Committee. Departmental-related Parliamentary Standing Committees (DRSCs)

Background

- 17 DRSCs were established in Parliament in 1993 on the proposal of the Lok Sabha Rules Committee.
- Seven more similar committees were established in 2004 and their numbers were thus increased from 17 to 24.

Objective

The fundamental purpose of the Standing Committees is to make the Executive (i.e. the Council of Ministers) more accountable (particularly in financial matters) to the Parliament. They also help the Parliament to discuss the budget more effectively.

Other facts about the DRSCs

- All the Ministries or Departments of the Central Government shall be governed by the 24 Standing Committees.

- Each standing committee consists of 31 members (21 from Lok Sabha and 10 from Rajya Sabha). The members of the Lok Sabha (or Rajya Sabha) are nominated by the Speaker (or Chairman) from amongst its own members.
- A Minister cannot be appointed to any of the DRSCs and if a member of a DRSC becomes a minister, he ceases to be a member of that committee. Each standing committee's term of office is one year from the date of establishment. Out of the 24, 8 DRSCs work under the Rajya Sabha and 16 DRSCs under the Lok Sabha.

Some examples of DRSCs under Rajya Sabha are

- Committee on Commerce (covers Ministries or Departments of Commerce and Industry)
- Committee on Home Affairs (covers Ministries or Departments of Home Affairs, Development of North-Eastern Region), etc.

Some examples of DRSCs under Lok Sabha are

- Committee on Agriculture (covers Ministries or Departments of Agriculture and Farmers' Welfare; Fisheries, Animal Husbandry and Dairying; Food Processing Industries)
- Committee on Information Technology (covers Ministries or Departments of Communication, Electronics & Information Technology, Information & Broadcasting), etc.

Functions

To consider the demands for grants (except anything of the nature of cut motions) of the concerned ministries or departments before they are discussed and voted in the Lok Sabha.

- To examine bills relating to the concerned ministries or departments.
- To consider annual reports of ministries or departments.
- To consider national basic long-term policy documents presented to the Houses.

Advantages

- There is no party bias in their proceedings.
- The procedure adopted by them is more flexible than in the Lok Sabha.
- The system makes parliamentary control over the executive much continuous and comprehensive.
- The system ensures economy and efficiency in public expenditure.

- They facilitate opportunities to all the MPs to participate and understand the functioning of the government and contribute to it.
- They can avail opinion of the experts (or public opinion) to make the reports.
- The opposition parties and the Rajya Sabha can now play a greater role in exercising financial control over the executive.

Limitations

- They should not consider the matters of day-to-day administration of the concerned ministries or departments.
- In general, these committees should not consider the issues that other parliamentary committees consider.
- The recommendations of these committees are advisory in nature, hence not binding on the Parliament.

1.6 MISSION KARMYOGI

Why in News: According to sources, the Government of India has prepared a comprehensive 60-point action plan to enable the government organisations to build capacity for Geographic Information System (GIS) planning and leverage satellite-based imaging potential.

The said action plan may be taken up as a campaign under the Government of India's mission - Karamyogi.

Mission Karmayogi

About: Expected to be the largest bureaucratic reform endeavour, Mission Karmayogi is a new capacity-building scheme for civil servants aimed at upgrading the post-recruitment training mechanism of the officers and employees at all levels.

Salient features

- The program will be delivered by setting up a digital platform called iGOT Karmayogi, governed by a wholly-owned not-for-profit Special Purpose Vehicle (SPV), set up under the Companies Act, 2013.
- Integrated government online training (iGOT) is a portal on the Ministry of Education's DIKSHA platform for the purpose of capacity building.
- The platform will be empowered with specific role-competencies, enabling a civil servant to ensure efficient service delivery of the highest quality standards.

- The platform will act as a launchpad for the National Program for Civil Services Capacity Building (NPCSCB), enabling a comprehensive capacity building reform at the individual, institutional and process levels.
- NPCSCB will be governed by the Prime Minister's Human Resource Council, which will approve and review civil service capacity building program and includes state Chief Ministers, Union Cabinet ministers and experts.

Significance

- Will radically improve the government's human resources by affirming the use of state-of-the-art infrastructure to increase the capacity of officials.
- The government officials and personnel will have the chance to improve their performance.
- It will prepare Indian bureaucrats for the future by making them more creative, constructive, imaginative, innovative, technology-enabled, etc.

Geographic information System (GIS): GIS is a computer system, working on the technology used for capturing, storing, checking and displaying data related to positions on Earth's surface. It is a tool, which by relating seemingly unrelated data can help individuals and organizations better understand spatial patterns and relationships.
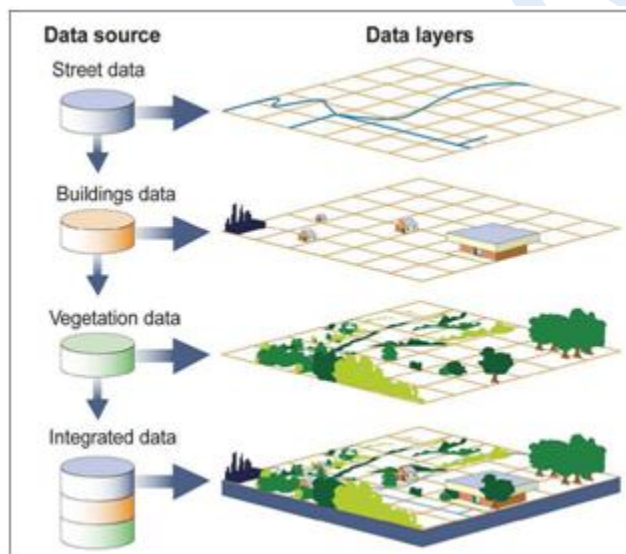
The system can include data about people, such as population, income or education level. It can include information about the landscape, such as the location of streams, different kinds of vegetation and different kinds of soil.

It can include information about the sites of factories, farms and schools or storm drains, roads and electric power lines.

60-point action Plan:

It can be broadly categorized under three heads - leveraging IT and technology for governance; improving business climate and upgrading the civil services. These action points will be assessed periodically and ministries and departments have been asked to appoint nodal officers to review the progress.

The action plan includes:

- To efficiently use the data more Chief Information Officers (CIOs) and Chief Technology Officers (CTOs) need to be appointed.
- Using GIS mapping for decision making to increase the country's GDP.
- Setting up a national mentoring platform for start-ups.

This will enable mentors to act as a single point contact for start-ups and entrepreneurs.

The platform may also support in organising initial funding.

- Under the central database called' Matribhumi', pushing for digitising all land records by 2023.
- With this, each parcel of land will have a Unique ID that will ease tracking of transactions. Integration with the e-Courts system will enable transparency on title or possession related issues.
- It directs the culture and tourism ministries to identify and develop 100-200 iconic structures and sites.
- The "centers of excellence" may be set up in rural areas through PPP, taking a cue from such centers in Singapore.

INTERNATIONAL RELATIONS

Paper II (GS): All the Articles of this section are relevant to the following topics:

- **India and its Neighbourhood – Relations**
- **Bilateral, Regional and Global Groupings and Agreements involving India and / or affecting India's Interests**
- **Prelims Oriented Questions and Places in News for Maps/ Matching**

2.1 G-20

Why in News: The two-day Group of 20 summit was kick started in Rome. Italy is the current chair of G20 and hence is hosting the summit.

G-20

- G-20 is a group of finance ministers and central bank governors from 19 individual countries and European Union. It was established in 1999.
- G20 was elevated to a forum of Heads of State/Government in 2008 to effectively respond to the global financial crisis of 2008.
- G-20 is a forum, not a legislative body, its agreements and decisions have no legal impact, but they do influence countries' policies and global cooperation.

News Update

- Italy is the host for the two-day Group of 20 summits which started in Rome.
- India is represented by PM Modi at the summit.
- This is the first in-person summit since the pandemic took hold.

Presidency

- The group has no permanent staff of its own, so every year in December, a G20 country from a rotating region takes on the presidency.
- That country is then responsible for organising the next summit, as well as smaller meetings for the coming year.
- They can also choose to invite non-member countries along as guests.
- The first G20 meeting took place in Berlin in 1999, after a financial crisis in East Asia affected many countries around the world.

Full membership of the G20

Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, the United States and the European Union.

Key Highlights

Availability of vaccines to poor countries

- Italy made a sharp call to pick up the pace in getting vaccines to poor countries.
- There is a global COVID-19 vaccine gap which is morally unacceptable.
- Only 3% of people in the world's poorest countries are vaccinated, while 70% in rich countries have had at least one shot.
- The participating leaders called for more collective vaccine help for low-income countries.

Global economy recovery

- Rich countries have used vaccines and stimulus spending to restart economic activity.
- Rich countries have spent 28% of annual economic output on pandemic recovery, while the figure is 2% for the poorest nations.
- This leaves the risk that developing countries that account for much of global growth will remain behind due to low vaccinations and financing difficulties.

Support to Africa

- European Union leaders will meet off-site with African leaders in efforts to further support the continent's poorest economies in the wake of the COVID-19 pandemic.
- The G-20 is expected to confirm an additional $100 billion to support Africa's economies.

Agreement on a Global Minimum Corporate Tax

- The G-20 leaders formally endorsed their commitment to establishing a 15% global minimum corporate tax rate by 2023.
- This measure is aimed at preventing multinational companies from stashing profits in countries where they pay few or no taxes.

Climate Change

- Leaders committed to the key Paris Agreement goal of limiting global warming to 1.5 degrees Celsius above pre-industrial levels. They also pledged to reach a target of net zero carbon emissions "by or around mid-century", instead of setting a clear 2050 date, as campaigners and summit host Italy were hoping for.
- **They agreed to stop funding new dirty coal plants abroad by the end of 2021.**
- They reaffirmed the so far unmet commitment to mobilise $100 billion for developing countries for climate adaptation costs.
- They approved on an agreement that will subject multinationals to a minimum 15 percent tax, as part of an effort to build "a more stable and fairer international tax system".

- **They decided to pursue the recognition of more vaccines by the World Health Organization under a "One Health approach" for the world, and providing finances and technology for vaccine production at "mRNA Hubs" in South Africa, Brazil and Argentina.**
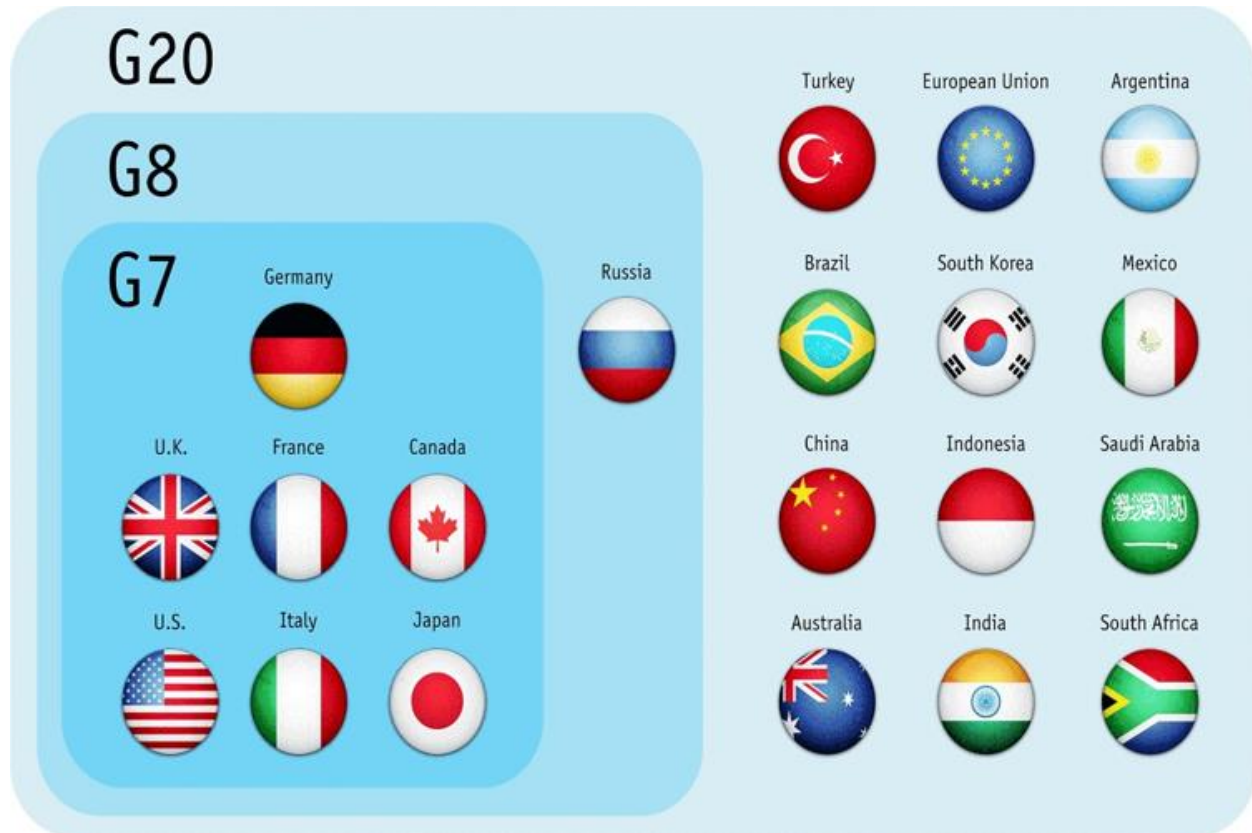
India's Stand at the summit

On addressing vaccine inequity across the world

- PM Modi stressed on the need to address vaccine inequity across the world, especially in developing countries.
- In this context, it was announced at the summit that India is ready to produce over 5 billion vaccine doses by the end of next year.
- These vaccines will be available not only for Indian citizens but for the rest of the world.

Emergency approval of vaccines by WHO

India conveyed that the early emergency approval to Covaxin by WHO will facilitate India's efforts to help other countries.

One Earth One Health

- PM Modi highlighted India's vision of "One Earth One Health". This vision highlights the need for a collaborative approach in the international domain in the fight against the pandemic.
- In this context, he emphasised on collaborative efforts in vaccine research, manufacturing and innovation. He also spoke about facilitating international travel and spoke about the mechanism of mutual recognition of vaccine certification as a means of achieving this.

Need for resilient global supply chains

- PM Modi stressed on the need for resilient global supply chains. He invited G-20 countries to make India their partner in economic recovery and supply chain diversification.
- Despite challenges of the pandemic, India continues to be a trusted partner in the context of reliable supply chains.

Global minimum corporate tax

India expressed satisfaction over the G-20's decision to come up with a 15-per cent minimum corporate tax. This tax will ensure that companies don't go to the lowest possible tax haven in order to minimise their tax burden and the large multinational corporations pay their share of taxes to countries that they are located in.

It was in 2014 G-20 summit in Brisbane that the India had first proposed this idea of a minimum corporate tax.

Bilateral Meetings

PM Modi held two bilateral meetings with French President Emmanuel Macron and Singapore Prime Minister Lee Hsien Loong.

With France

Indian PM welcomed the European Union's Indo-Pacific strategy, and thanked the French President for his leadership role in developing the strategy. The two leaders reaffirmed their commitment

- To cooperate in the Indo-Pacific
- To find new and innovative ways to cooperate to further the objective of free, open and inclusive, rules-based order in the region.

There was also discussion on the forthcoming COP26 in Glasgow and climate change-related issues and the need to focus on climate finance.

With Singapore

- Modi's meeting with the Singapore PM was their first in-person meeting in the post-pandemic period.
- Both leaders discussed global efforts to combat climate change and the forthcoming COP26.
- PM Modi appreciated Singapore's outreach to provide Covid assistance to India during the second wave.

PM Modi meets Pope Francis at Vatican

- Prime Minister Narendra Modi met Pope Francis at the Vatican in his first meeting with the head of the sovereign of the Vatican City State.
- Modi is the fifth Indian Prime Minister to have visited the head of Roman Catholics, the largest religious denomination in the world.
- The meeting assumes significance as Christians in many parts of India have been complaining of harassment and attacks on the community and its institutions.

2.2   INDIA-ASEAN SUMMIT

Why in News: PM Modi participated in the 18th India-ASEAN Summit that was held virtually.

Key Summary of the summit

ASEAN – India Summit

- ASEAN-India Summits are held annually. It provides opportunity for India and ASEAN to engage at the highest level.
- PM Modi attended the 17th ASEAN-India Summit held virtually in November last year.
- 18th ASEAN-India Summit will be the ninth ASEAN-India Summit to be attended by him.

ASEAN-India Engagement

- ASEAN and India became Summit-level partners in 2002, and Strategic partners in 2012.
- There is ample closeness between India's "Indo Pacific Oceans Initiative" and ASEAN's "Outlook on Indo Pacific".
- India firmly believes that a "Cohesive and Responsive ASEAN" is essential for "Security and Growth for All in the Region".

India-ASEAN Trade Relation

In general, ASEAN is India's 4th largest trading partner and India is ASEAN's 7th largest trading partner accounting for 10.2% of India's total trade.

Total bilateral trade between India and ASEAN for FY19 was $ 96.7 billion of which

- India's export to ASEAN consisted $37.4 billion and
- Its import form ASEAN constituted $ 59.3 billion.
- Balance of trade is highly favourable to ASEAN.
- ASEAN and India have set a trade target of 200 billion USD by 2022.
- There has been significant recovery of FDI inflows from India in 2018, amounting to 1.7 billion USD.
- This placed India as ASEAN's sixth largest source of FDI among ASEAN Dialogue Partners.

On trade and investment, the review of ASEAN-India Trade in Goods Agreement (AITIGA) has been long pending. India has called for an early review of the Agreement.

India's Indo-Pacific Oceans Initiative (IPOI)

- In November 2019, while participating in 14th EAS, PM Modi launched the Indo-Pacific Oceans Initiative (IPOI).
- IPOI seeks to ensure security and stability of the regional maritime domain.
- IPOI is an open, non-treaty-based initiative for countries to work together for cooperative and collaborative solutions to common challenges in the region.

IPOI draws on existing regional architecture and mechanisms to focus on seven pillars:

- Maritime Security
- Maritime Ecology
- Maritime Resources
- Capacity Building and Resource Sharing
- Disaster Risk Reduction and Management
- Science, Technology and Academic Cooperation
- Trade Connectivity and Maritime Transport

ASEAN Outlook for the Indo-Pacific (AOIP)

- In June 2019, the ten-member Association of Southeast Asian Nations (ASEAN) has adopted the 'ASEAN Outlook on the Indo-Pacific'.
- It outlines the ASEAN's concept and strategy of the Indo-Pacific.

News Update

Recently, PM Modi participated virtually in the 18th India-ASEAN Summit. He co-chaired the summit along with the Sultan of Brunei. Brunei is the current chair of ASEAN.

Key Outcome of the Summit

2022 as India-ASEAN Friendship Year

- The year 2022 will mark the completion of 30 years of India-ASEAN Partnership. India will also complete 75 years of its Independence.
- In this context, the leaders announced the Year 2022 as India-ASEAN Friendship Year.

Centrality of ASEAN in India's Vision towards Indo-Pacific

PM Modi underlined the centrality of ASEAN in India's Act East Policy and in India's Vision for the wider Indo-Pacific Vision.

- Launched in 2014, India's Act East policy is an upgrade of the Look East Policy.
- It is a diplomatic initiative to promote economic, strategic and cultural relations with the vast Asia-Pacific region at different levels.

ASEAN Outlook for the Indo-Pacific (AOIP) and India's Indo-Pacific Oceans Initiative (IPOI)

- Participating leaders decided to build upon the synergies between the AOIP and IPOI.
- Against this backdrop, both sides welcomed the adoption of the India-ASEAN Joint Statement on cooperation for peace, stability and prosperity in the region.

Cooperation in fight against COVID-19

- PM Modi highlighted India's efforts in the fight against the pandemic in the region and also reiterated support for ASEAN's initiatives in this regard.
- India has contributed medical supplies worth USD 200,000 to ASEAN's humanitarian initiative for Myanmar and USD 1 million for ASEAN's Covid-19 Response Fund.
- The ASEAN leaders appreciated India's role as a trusted partner in the region especially during the current Covid-19 Pandemic with its supply of vaccine.

India-ASEAN connectivity

- Views were exchanged on enhancing India-ASEAN connectivity in broadest terms including physical, digital and people to people.

- To further strengthen India-ASEAN cultural connectivity, PM Modi announced India's support for establishing the ASEAN Cultural Heritage List.

On trade and investment

- Both sides underlined the importance of diversification and resilience of supply chains for post-COVID economic recovery.
- In this regard, they also stressed upon the need to revamp the India-ASEAN FTA.

Promoting a rules-based order in the region

- The summit also discussed the regional and international issues of common interest and concern, including South China Sea and terrorism.
- Both sides noted the importance of promoting a rules-based order in the region including through upholding adherence to international law, especially the UNCLOS.
- The leaders affirmed the importance of maintaining and promoting peace, stability, safety and security in the South China Sea, and ensuring freedom of navigation and over flight.

2.3 EAST ASIA SUMMIT

Why in News: PM Modi participated in the **16thEast Asia Summit (EAS) via videoconference**.

East Asia Summit

EAS is a meeting of 18 regional leaders for strategic dialogue and cooperation on the key political, security, and economic challenges facing the Indo-Pacific region.

It comprises of

- **ten member states of the Association of Southeast Asian Nations (ASEAN) – Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam**
- Along with Australia, China, Japan, India, New Zealand, the Republic of Korea, Russia and the United States.

The EAS membership represents around 54% of the world's population and accounts for 58% of global GDP. Six priority areas of regional cooperation within the framework of the EAS

- Environment and Energy
- Education

- Finance
- Global Health Issues and Pandemic Diseases
- Natural Disaster Management, and
- ASEAN Connectivity

India's Indo-Pacific Oceans Initiative (IPOI)

- In November 2019, while participating in 14th EAS, PM Modi launched the Indo-Pacific Oceans Initiative (IPOI).
- IPOI seeks to ensure security and stability of the regional maritime domain.
- IPOI is an open, non-treaty based initiative for countries to work together for cooperative and collaborative solutions to common challenges in the region.
- IPOI draws on existing regional architecture and mechanisms to focus on seven pillars:
  - Maritime Security
  - Maritime Ecology
  - Maritime Resources
  - Capacity Building and Resource Sharing
  - Disaster Risk Reduction and Management
  - Science, Technology and Academic Cooperation
  - Trade Connectivity and Maritime Transport

News Update

- Recently, the 16thEast Asia Summit was hosted by Brunei. Brunei is the current chair of EAS and ASEAN.
- The summit saw the participation of leaders from ASEAN countries and other EAS Participating Countries including:
- Australia, China, Japan, South Korea, Russia, USA and India. India was represented by PM Modi who participated virtually. India has been an active participant of EAS. This was Prime Minister's 7th East Asia Summit.

Important regional and international issues

The summit discussed important regional and international issues including: Indo-Pacific, South China Sea, UNCLOS, terrorism, and situation in Korean Peninsula and Myanmar.

It adopted three Statements on

  - Mental Health
  - Economic recovery through Tourism and

- Sustainable Recovery
- These statements have been co-sponsored by India

India's stand at the summit

Importance of a resilient global value chain highlighted

- PM Modi emphasised the importance of a resilient global value chain.
- In this context, he highlighted the role of 'Atmanirbhar Bharat' campaign in post-pandemic recovery and in ensuring resilient global value chains. He emphasised on establishment of a better balance between economy and ecology and climate sustainable lifestyle.

Fight against the pandemic

Indian leader reiterated India's commitment to provide Quad-sponsored vaccines to Indo-Pacific nations. He also recalled India's support of $1 million to ASEAN Covid-19 Recovery Fund.

Rule based order and cyber Security

He stressed the importance of Free, Open and Inclusive Indo-Pacific. India, during the summit, raised the idea of developing global standards on cyber security.

ASEAN centrality

PM Modi reaffirmed "ASEAN centrality" in the Indo-Pacific. He highlighted the synergies between ASEAN Outlook on Indo-Pacific (AOIP) and India's Indo-Pacific Oceans Initiative (IPOI).

In June 2019, the ten-member Association of Southeast Asian Nations (ASEAN) has adopted the 'ASEAN Outlook on the Indo-Pacific'. It outlines the ASEAN's concept and strategy of the Indo-Pacific.

2.4 INDIA BANGLADESH

Why in News: India's foreign secretary Harsh Vardshan Shringla delivered a video address at the Swarnim Vijay Varsh Conclave2021. Theme of this conclave was "Humanitarian, Political and Diplomatic Facets of the 1971 War".

India-Bangladesh Relations

India was the first country to recognize Bangladesh as a separate and independent state and established diplomatic relations with the country immediately after its independence in December 1971.

The relationship between India and Bangladesh is rooted in history, culture, language and shared values of secularism, democracy, and many other commonalities between the two countries.

Bilateral institutional mechanisms

- There are more than 50 bilateral institutional mechanisms between India and Bangladesh in the areas of security, trade & commerce, power & energy, transport & connectivity, science and technology, defence, rivers & maritime affairs etc.
- A Joint Consultative Commission (JCC) led by the Ministers of Foreign/External Affairs coordinates and oversees implementation of initiatives taken between the two countries as well as explores newer avenues for cooperation

Security & Border Management

- India and Bangladesh share 4096 km of border, which is the longest land boundary that India shares with any of its neighbors.
- A number of agreements related to security cooperation have been signed between both the countries.
- The Coordinated Border Management Plan (CBMP) signed in 2011 aims to check cross border illegal activities and crimes, and maintain peace along the border.

Sharing of River Waters

- India and Bangladesh share 54 common rivers. A bilateral Joint Rivers Commission (JRC) is working since 1972 to maintain communication between the two countries to maximize benefits from common river systems.
- The Ganga Waters Treaty signed in 1996 for sharing of waters of river Ganga during lean season (January 1-May 31) is also working satisfactorily.

Trade relations

- Bangladesh is India's biggest trade partner in South Asia and bilateral trade between India and Bangladesh has grown steadily over the last decade.
- India has provided duty free access to Bangladesh under South Asian Free Trade Area (SAFTA) since 2011.
- India's exports to Bangladesh in FY 2018-19 stood at US$ 9.21 bn and imports from Bangladesh during the same period were US$1.04 bn.

Energy Cooperation

- Energy cooperation between the two sides has also shown a lot of progress.
- Indian state Tripura supplying a total of 160 MW of power to Bangladesh, besides the 500 MW being supplied from West Bengal since 2013.
- Bangladesh has offered two special economic zones (SEZs) for investment by private Indian companies in Bheramara, Kushtia and the coastal Mongla belt in Bagerhat.
- In September 2018, the leaders of the two countries jointly inaugurated the construction of a friendship pipeline project.
- The 130-kilometre India-Bangladesh Friendship Pipeline Project will connect Siliguri in West Bengal in India and Parbatipur in Dinajpur district of Bangladesh.

Development Partnership:

- India has extended 3 Lines of Credits (LOC) to Bangladesh in the last 8 years, amounting to US$ 8 billion. This makes Bangladesh the largest recipient of LOC funds from India till date.
- A line of credit is a credit (borrowing) facility given by a bank or other financial institution to a government, business or individual customer. It is effectively a source of funds that a borrower can rely on, when it needs money.

- In addition to LOC funds, India also provides grant assistance to Bangladesh for projects under 'Aid to Bangladesh'.
- Projects such as construction of school/college buildings, laboratories, deep tube wells, community centers, renovation of historical monuments/buildings etc have been financed by India under this program.

Human Resource Development cooperation

- Human resource development is a key component of India's development cooperation efforts in Bangladesh through its several ongoing training programs and scholarships.
- India has been training 1800 Bangladesh Civil Service officials from 2019 at National Centre for Good Governance (NCGG), Mussoorie.
- Bangladeshi police officials are also being trained at various premier training institutes in India on various modern policing and new investigative techniques of this information age.
- Similarly, India has been extending training for 1500 Bangladeshi judicial officials since 2017 at National Judicial Academy, Bhopal and also at various State Judicial Academies in India.

- In addition, 200 scholarships are awarded by ICCR (Indian Council for Cultural Relations) every year to students from Bangladesh for pursuing under-graduation, post-graduation and M.Phil/PhD courses in educational institutes of India including the IITs and NIITs.

Connectivity

- India-Bangladesh is a good example of connectivity through all modes of transport.
- The Protocol on Inland Water Trade and Transit (PIWTT) has been operational since 1972. It permits movement of goods over vessels from India through the river systems of Bangladesh on eight specific routes.
- The movement of goods by road is operationalised through 36 functional Land Customs Stations (LCSs) and 2 Integrated Check Posts (ICPs) along the border.
- There are four Broad Gauge inter-country rail links between the two countries that are operational.
- There are regular bus services between Kolkata-Dhaka, Shillong-Dhaka and Agartala-Kolkata via Dhaka

Cultural Exchanges

- The Indira Gandhi Cultural Centre (IGCC), is a cultural centre of the Indian Council for Cultural Relations of India in Bangladesh.
- Inaugurated in 2010, IGCC regularly organizes program covering a wide-range of cultural activities. The IGCC also holds regular training courses in Yoga, Hindi, Hindustani Classical Music, Manipuri Dance, Kathak and Painting.

Indian Assistance during COVID-19 Pandemic

- India gifted one lakh anti-malarial tablets of hydroxychloroquine and 50,000 surgical gloves to Bangladesh. It also donated 30,000 COVID-19 test kits to Bangladesh.
- In January 2021, India supplied 2 million doses of Made-in-India Covid-19 vaccines to Bangladesh under Vaccine Maitri initiative.

News Update

- Recently, India's Foreign Secretary Harsh Shirngla delivered a speech on the role of the IAF in the 1971 War of Liberation at a conclave.
- The conclave was celebrating the golden jubilee of 1971 Indo-Pak war victory at the Air Force station - Yelahanka, Bengaluru.
- During the speech, he recollected the sacrifices that Indians made to assist the people of Bangladesh fight the genocidal violence of the Pakistani military.

Current status of the relationship

- India-Bangladesh relations today are deeper than any other strategic partnership. It is a role model for relations between two neighbouring countries.
- The relationship rests on two pillars of India diplomacy – Neighbourhood First Policy and Act East.
- The spirit of friendship, understanding and mutual respect engendered during the liberation of Bangladesh continues to permeate different aspects of this relationship.

- He highlighted that Bangladesh is India's biggest development partner and India's largest trading partner in South Asia. It is contributing to economic prosperity and supply chain resilience in the region and beyond.

2021: A Golden Chapter

The fact that Modi's first foreign visit since pandemic to Dhaka to commemorate the golden jubilee is testimony to the highest priorities the countries attach to the relationship.

2021 marks the Triveni of events that have epochal significance:

- The golden jubilee of liberation of Bangladesh
- the birth centenary of Sheikh Mujibur Rahman
- 50th anniversary of diplomatic ties

Bangladesh's decision to establish a memorial in remembrance of the sacrifices made by members of Indian armed forces in 1971 was a key step towards preserving this history of shared sacrifice.

Cautious approach taken by India

- The speech had no mention of the condition of the minority Hindu community which faced targeted attacks during the recent Durga puja celebrations.
- Violence had erupted targeting the Hindu community in Comilla, Chittagong, Noakhali and Rangpur in Bangladesh.
- It reflects that India has adopted a cautious approach in dealing with the recent attacks.

Bangladesh & China: High-profile projects:

- Bangladesh has several high-profile projects being built by the Chinese.

- Recently, Bangladesh govt inaugurated one such project — Bangabandhu Bangladesh China Friendship Exhibition Centre (BBCFEC) on the outskirts of Dhaka.
- Built over 26 acres, the centre is a showpiece of the close cooperation between Bangladesh and China.
- The venue will be able to host fairs and exhibitions around the year

2.5 INDIA-BHUTAN

Why in News: Recently, Bhutan and China signed a Memorandum of Understanding (MoU) on the "three-step roadmap" for expediting the Bhutan-China boundary negotiations.

Background

- Bhutan shares ancient religious, cultural and economic ties with Tibet. However, with China's annexation of Tibet in 1950, the buffer between China and Bhutan was eliminated.
- Bordering the glaciers and arid deserts of the Tibetan plateau, the border between Bhutan and China spans a length of 477 kilo-meters.
- The dispute between the two countries began in the 1950s when China started claiming Bhutanese territory by issuing new maps.
- The disputed areas include the north-western and central Bhutan involving Samtse, Haa, Paro and Wagdue Phodrang districts, respectively, covering 764 sq. km.
- In the 1959 military campaign against Tibetans, China seized control over eight Bhutanese enclaves in Tibet.
- Since Bhutan and Tibet had not demarcated their border, after the Chinese annexation of Tibet, this led to severe Chinese incursions into Bhutan, mainly in 1967, 1979, 1983 and 2017.
- The Doklam plateau in north-western Bhutan, near the India-Bhutan-China tri-junction, became a flashpoint between the armies of India and China in 2017.

Steps towards resolving the Sino-Bhutanese Border Dispute

- Between 1984 and 2016 there have been 24 rounds of talks between Bhutan and China, conducted despite a lack of formal diplomatic ties between the two countries.
- The 25th round has been delayed for almost five years, first by the 2017 Doklam standoff, and more recently the Covid-19 pandemic.
- In 1996, China had offered Bhutan a deal, which technically still remains on the table, in which China agreed to renounce its claims in northern Bhutan at the Pasamlung and Jakarlung valleys.

- In return, Bhutan would concede Doklam, Sinchulung, Dramana, and Shakhatoe in the west.

India's Objection

- Bhutan was close to signing this agreement in 2001. However, India's interjection ensured that Bhutan does not accept the deal offered by China.
- India motivated Bhutan to not sign the deal as Doklam is of strategic importancefor India.
- Doklam is an area with a plateau and a valley which lies on the Bhutan-China border, near India.
- Doklam's geographical position makes it a strategically important area as it is located between Tibet's Chumbi valley to the North, Bhutan's Ha valley to the East and India's Sikkim state to the West.
- Access to Doklam would give China an upper hand at conquering India's Siliguri Corridor which connects India's north-eastern states to the rest of the country.

India-Bhutan Defence Relations

- In 1949, India and Bhutan had signed a peace treaty, the "Treaty or Perpetual Peace and Friendship", calling for peace between the two nations. As per the treaty, Government of Bhutan agreed to be guided by the advice of the Government of India in regard to its external relations.
- There is no mention of defence in the treaty, although it is mentioned that both nations would consult each other closely in foreign and defence affairs. In February 2007, India and Bhutan renewed the 1949 Treaty and both countries agreed to cooperate closely with each other on issues relating to their national interests.
- The Indian Military Training Team (IMTRAT), established since 1961-62, is responsible for the training of the personnel of the Royal Bhutan Army (RBA) and the Royal Bodyguard of Bhutan (RBG).

News Update

Recently, during a virtual-conference held between Bhutan and China, the two countries signed a Memorandum of Understanding (MoU) to help speed up boundary talks that have been delayed. It is expected that the MoU will make a meaningful contribution to speed up the negotiation on demarcation and promote the process of establishing diplomatic ties between the two countries.

The signing of the MoU came amid continuing standoff between Indian and Chinese troops in several friction points in eastern Ladakh.

2.6 INDIA -DENMARK

Why in News: The Prime Minister of Denmark paid an official visit to India.

India-Denmark Relations

Danish PM held a bilateral talk with Indian PM with a focus on expanding cooperation in a range of key areas such as:

Health, agriculture, water management, climate change and renewable energy

List of MoUs /Agreements exchanged

- MoU on mapping of ground water resources and aquifers
- Traditional Knowledge Digital Library Access Agreement
- MoU to establish a Centre of Excellence towards natural refrigerants for tropical climates with potential applications.
- MoU on the development of the Hydrogen Electrolyzer and the subsequent manufacturing and deployment of the Hydrogen Electrolyzer in India.
- MoU to establish a 'Center of Excellence for Sustainability Solutions' based in Denmark.
- MoU on strategic cooperation to promote knowledge-sharing on solutions and facilitate research on the green transition of the economy.

Five-year Action Plan for the Green Strategic Partnership

- Both sides reviewed the progress made under the India-Denmark Green Strategic Partnership.
- During the Virtual Summit held in September 2020, India and Denmark had established a 'Green Strategic Partnership'.
- It aims to create a framework for significant expansion of cooperation in areas of renewable energy, environment, economy, climate change and science and technology.

Cooperation in Agriculture sector: Both sides decided to cooperate in areas like

- Efficient supply chain
- Smart water resources management and
- Technologies relating to the farm sector to increase agricultural productivity in India.

Sustainable development and green growth

- The two Prime Ministers agreed to enhance the commercial cooperation with new technologies, in particular green hydrogen, E-mobility and storage.
- Both sides noted the active global collaboration on new green energy technologies, including under EU Horizon Programs and Mission Innovation.
- The two leaders welcomed the sustainable water entrepreneurship initiative under the Niti Aayog – Atal Innovation Mission and Innovation Center Denmark 'Water Challenge' in 2022 and 2023.

India Denmark Relations

Bilateral relations between India and Denmark are cordial and friendly, based on synergies in political, economic, academic and research fields.

Prime-Ministerial level interactions

- There have been periodic high-level visits between the two countries. In September 2020, PM of both the countries held a virtual summit. Green Strategic Partnership was launched between the two countries during the Summit.

India-Nordic Summit – First such summit took place in 2018. Second India-Nordic summit is to be convened in Copenhagen in 2022.

Institutional Mechanism: The India-Denmark Joint Commission was established in February 2008. The aim of this platform is to

- Work towards Green Strategic Partnership
- Facilitate Parliamentary exchanges
- Deepen economic engagement and
- Expand cooperation in multilateral organizations.

Commercial and Economic Relations

The total volume of bilateral trade in goods and services between India and Denmark was US$ 3.58 billion in 2020.

For financial year 2020 – 21

- India's export to Denmark - $755.25 million
- India's import from Denmark - $589.13 million

The major export items from India to Denmark are textiles, apparels and yarns related. Other items include

- road vehicles and components, metal goods, iron and steel, footwear, travel goods including leather goods, industrial machinery and accessories, chemical material and products, etc.

Major Danish exports to India are medicinal/pharmaceutical goods, power generating machinery, industrial machinery, metal waste and ore, organic chemicals, etc.

Investment

- India and Denmark have strong trade and investment ties.
- More than 200 Danish companies are present in India and over 60 Indian companies have a presence in Denmark.
- There exists strong collaboration in the fields of renewable energy, clean technologies, water and waste management, agriculture and animal husbandry, science & technology, digitisation including ICT, smart cities, shipping, etc.

SECURITY AND DEFENCE

❖ **Paper III: This section is relevant to the following topics:**

• **Linkages between development and spread of extremism.**
• **Role of external state and non-state actors in creating challenges to internal security.**
• **Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention**
• **Security challenges and their management in border areas; linkages of organized crime with terrorism**
• **Various Security forces and agencies and their mandate**

❖ **Prelims Oriented Questions**

3.1 BORDER SECURITY FORCE

Why in News: The Ministry of Home Affairs has extended the jurisdiction of BSF from 15 km to 50 km inside the international border along Punjab, West Bengal and Assam.

Border Security Force (BSF)

- It is one of the five Central Armed Police Forces (CAPF) of India and was raised in December 1965.
- It was raised in the wake of the 1965 War to ensure the security of the borders of India.
- It is the only CAPF which has its own Water Wing, Air Wing and other ancillary units.
- The Force Headquarters is in New Delhi.
- It works under the administrative control of Ministry of Home Affairs.

Background

- Till 1965 India's border with Pakistan were manned by the State Armed Police Battalion.
- On 09th April, 1965 Pakistan attacked Sardar Post, Chhar Bet and Beria Bet in Kutch.
- This exposed the inadequacy of the State Armed Police to cope with armed aggression.
- As a result, the Government felt the need for a specialized centrally controlled Border Security Force. Against this backdrop, BSF can into existence.

Operations

Its operational responsibility is spread over 6,386.36 km of International Border with Pakistan and Bangladesh.

Peace Time Role

- Promote a sense of security among the people living in the border areas.
- Prevent trans-border crimes, unauthorized entry into or exit from the territory of India.
- Prevent smuggling and any other illegal activity.

War Time Role

- Holding ground in less threatened sectors so long as the main attack does not develop in a particular sector
- Protection of vital installations particularly air-fields
- Limited aggressive action against Para military or irregular forces of the enemy within the overall plan of the Armed forces

- Guarding of prisoners of war cages.
- Assistance in control of refugees

It is also deployed on Line of Control (LoC) in J&K under the Operational control of the Army.

Overseas Deployment

- BSF contributes its personnel every year for UN Missions.
- It is handling the security issues on the famous Kartarpur Corridor.

At the time of natural disaster/calamities, BSF provides assistance in areas of deployment such as

- Kashmir flood in 2014
- Kerala flood in 2018 and
- Kedarnath Tragedy in 2013

News Update

Through a notification, the Home Ministry has extended the area under jurisdiction of the BSF.

The area under jurisdiction of the BSF has been extended to a 50 km-belt in West Bengal, Punjab and Assam, running along country's border.

- Earlier it was 15 km inside the international border.
- In this stretch, the officers of BSF have powers of arrest, search and seizure, on par with their counterparts in the police.
- The border stretch under BSF in Gujarat stands reduced to 50 km from 80 km earlier.
- The area remains the same in Rajasthan at 50 km.
- As was the case earlier, no such limit has been prescribed for the five north-eastern states of Meghalaya, Nagaland, Mizoram, Tripura and Manipur or the UTs of J&K and Ladakh.

- ❖ Section 139 of the Border Security Force Act, 1968, empowers the Centre to notify the area and extent of border force's operational mandate.
- ❖ Every order (notification) made under Section 139 of this act must be subsequently laid before each house of Parliament.
- ❖ Using this act, Centre issues notification revising the 'Schedule' specifying the border stretch where BSF would have powers of search, seizure and arrest.

Earlier notification

- Earlier notifications were published in September 1969, June 2012; and July 2014.
- As per these notifications, the 'Schedule' area comprised
  - The states of Manipur, Mizoram, Nagaland, Tripura, Meghalaya and J&K
  - Area within 80 km border belt in Gujarat, 50 km in Rajasthan, and 50 km in WB, Assam and Punjab.

This step is meant to improve operational efficiency and crack down on smuggling rackets. Punjab has the problem of drugs and arms smuggling. Similarly, Assam and West Bengal face the issue of cattle and fake currency smuggling. These borders are also prone to illegal migration.

BSF regularly gets inputs about illegal activity deep in the hinterland but their hands were tied beyond 15 km.

Controversy

- Law & Order is a state subject and powers of search, seizure and arrest typically lies with state police officials. Hence, the affected states have questioned the step as an encroachment upon their powers and against the federal structure.
- It is being termed as an attempt to "interfere through Central agencies".
- Questions have also been raised about the controversial provisions under the BSF Act:
  - Section 139 (ii) gives sweeping powers of arrest to BSF.
  - It has powers of preventive arrest under Section 139 (1) &post offence arrest under 139 (ii).
  - No mention of consultation with local police.

3.2 DEFENCE PUBLIC SECTOR UNITS

Why in News: While inaugurating seven new Defence Public Sector Units (DPSUs) recently, the Prime Minister (PM) of India reiterated that the goal of the Atmanirbhar Bharat (self-reliant India) campaign is to make India one of the biggest military powers in the world.

The Seven Defence Public Sector Units (DPSUs)

- Earlier, the TKS Nair Committee (2000), the Vijay Kelkar Committee (2005) and the Vice Admiral Raman Puri Committee (2015), have advised restructuring of the Ordnance Factory Board (OFB) into a corporate entity.
- Also, the Comptroller and Auditor General (CAG) noted in a report that production in OFB factories could achieve targets for only 49% of items in 2017-18, adversely affecting the operational preparedness of Indian armed forces.

- Hence, the decision of creating these companies was stuck for a long time, leading to the country's dependence on foreign suppliers for defence equipment needs (defence export has increased by 325% in the last five years in India).
- As a result, the Government of India decided to corporatise the 250-year-old OFB recently.
- Consequently, the OFB ceased to exist (from October 1), with its 41 ordnance factories transferring their assets, staff and operations to seven defence public sector units (DPSUs).

Name and Nature

- Munitions India Ltd (MIL), Armoured Vehicles Nigam Ltd (AVANI), Advanced Weapons and Equipment India Ltd (AWE India), Troop Comforts Ltd (TCL), Yantra India Ltd (YIL), India Optel Ltd (IOL) and Gliders India Ltd (GIL).
- These will be 100% Government owned corporate entities under the Ministry of Defence, Government of India.

Each of these PSUs will run clusters of ordnance factories involved in manufacturing similar categories of products. The seven new entities will function like any other existing DPSU such as Hindustan Aeronautics Ltd (HAL) or Bharat Electronics Limited (BEL).

Service conditions of employees: There will be no change in service conditions of OFB employees and shall continue to be subjected to all rules and regulations as are applicable to the Central Government servants.

Significance

- It will enhance functional autonomy, efficiency and unleash new growth potential and innovation, making products cost-competitive and enhance their quality.
- It will ensure smoother and more timely meeting of domestic targets, stepping up India's defence exports.

Concerns

- **OFB still a 'war reserve':** For example, the recent order to Heavy Vehicles Factory (HVF), Chennai for 118 units of the Main Battle Tank Arjun's Mark-1A variants for the Army, is testimony to the reliability of the ordnance factories.
- **Commercially unviable:** A corporate entity would not be able to survive the unique market environment of defence products with its unstable demand-supply dynamics.
- **Move towards privatisation:** The experience of the past is that corporatisation is a route to privatisation and workers federations fear that this may result in job losses.

- **Other options are also available:** The Shekatkar Committee (2015) did not propose corporatisation but advised periodic audits of all ordnance units in consideration of past performance.

News Update - The PM of India's address:

- In the 21st century, R&D and innovation are determining the growth and brand value of any nation or any organisation.
- The new defence companies are a part of the various resolutions which the nation is pursuing to build a new future for the country during the 75th year of India's independence.
- Paying tributes to Dr APJ Abdul Kalam, the PM of India said that restructuring of Ordnance Factories will give strength to his dream of a strong India.
- The 7 new companies would form a strong base for the military strength of the country in the times to come, enabling India to become one of the biggest military powers in the world.
- These DPSUs would play an important role in import substitution, in line with the vision of Atma Nirbhar Bharat.
- The public and private sectors are now working together in the mission of national security. For example, Uttar Pradesh and Tamil Nadu Defence Corridors are examples of the new approach.
- The aim is not only to provide Indian enterprises with know-how on their products but to become a global brand.
- Although competitive cost is the strength of India, the identity of India must be of quality and reliability.

ECONOMY

❖ **Paper III: The articles in this section are relevant to the following topics:**

- **Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.**
- **Inclusive growth and issues arising from it.**
- **Government Budgeting.**
- **Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth.**
- **Infrastructure: Energy, Ports, Roads, Airports, Railways etc.**
- **Investment models.**
- **Agriculture**

4.1 UDAN SCHEME

Why in News: Recently, the Union Minister for Civil Aviation flagged off the first direct flight on Agra – Lucknow route under the Ude Desh Ka Aam Naagrik (UDAN) scheme of the Government of India.

Regional Connectivity Scheme – UDAN

UDAN (Ude Desh Ka Aam Naagrik) is a regional connectivity scheme launched by the Government of India, as a part of the National Civil Aviation Policy in 2016.

Objectives

- To make flying affordable for the masses
- To promote balanced regional growth

UDAN, which will be in operation for a period of 10 years (2016-26), envisages providing connectivity to un-served and underserved airports through revival of existing airports and air strips.

Implementing Agency: Airport Authority of India (AAI)

Funding Pattern for the Scheme

Regional air connectivity is envisioned under the UDAN scheme by supporting airline operators through:

- Concession by Central Government, State Governments/UTs and airport operators to reduce the cost of operations on regional routes; and
- Financial Viability Gap Funding (VGF) support to meet the gap, if any, between the cost of airline operations and expected revenues on such routes.

VGF will be shared between Ministry of Civil Aviation and the State Government in the ratio of 80:20 whereas for the States in North-Eastern region/UTs the ratio will be 90:10.

Performance of the Scheme: Thus far, RCS – UDAN scheme has gone through different phases in which new flight routes and airports/airstrips have been added under the program:

UDAN 1.0: 5 airlines companies were awarded 128 flight routes to 70 airports.

UDAN 2.0

- In Phase 2, helipads were also connected.
- In this phase, Central government awarded contracts to 15 airliners to operate in 325 routes across hilly, remote areas.
- It involved connecting 56 new airports and helipads to 36 existing aerodromes, as per the Ministry of Civil Aviation.

UDAN 3.0

- Inclusion of Tourism Routes under Phase 3 in coordination with the Ministry of Tourism.
- Inclusion of Seaplanes for connecting Water Aerodromes.
- Bringing in a number of routes in the North-East Region under the ambit of UDAN.

UDAN 4.0

Phase 4 of the scheme was launched in December 2019 with a special focus on North-Eastern Regions, Hilly States, and Islands.

UDAN 4.1

- Launched in March 2021, the UDAN 4.1 round is focused on connecting smaller airports, along with special helicopter and seaplane routes.
- In addition to these, some new routes have been proposed under the Sagaramala Seaplane Services in consultation with the Ministry of Ports, Shipping, and Waterways.

Since the launch of modern civil aviation in India in 1911, only 76 airports had been connected by scheduled commercial flights. Since October 2016, 371 routes and 60 airports (including 5 heliports and 2 water aerodromes) have been operationalized under the UDAN scheme.

4.2   GATI SHAKTI PLAN

Why in News: In a historic event for the infrastructure landscape of the country, the Prime Minister (PM) of India launched PM GatiShakti: National Master Plan for multi-modal connectivity recently.

Background

For decades, the building of infrastructure in India suffered from several problems such as lack of coordination between various government agencies, slow approval processes, etc, leading to the wastage of taxpayer's money.

To overcome these challenges, the Government has given unprecedented focus on infrastructure through a holistic outlook during the last few years.

PM GatiShakti - National Master Plan

- It is a plan for multi-modal connectivity, to give more speed (Gati) and power (Shakti) to projects by connecting all concerned departments on one platform.
- The various government departments which will join hands for coordinated developmental projects include the ministries of road to railways, aviation to agriculture.
- While the Government has not specified the size of the program in financial terms, it will subsume the Rs 110 lakh crore National Infrastructure Pipeline (launched in 2019).

Six pillars of PM GatiShakti

- ❖ **Comprehensiveness:** It will include all the existing and planned initiatives of various ministries and departments with one centralized portal.
    - ▪ For example, it will incorporate the infrastructure schemes of various Ministries and State Governments like Bharatmala, Sagarmala, UDAN etc.
    - ▪ It will also cover economic zones like textile clusters, electronic parks, etc, to improve connectivity and make Indian businesses more competitive.

- ❖ **Prioritisation:** It will enable different departments to prioritise their projects through cross-sectoral interactions.
- ❖ **Optimisation:** It will assist different ministries in planning for projects after the identification of critical gaps. For example, for the transportation of goods the plan will help in selecting the most optimum route in terms of time and cost.
- ❖ **Synchronisation:** It will help in synchronising the activities (different layers of governance) of each department in a holistic manner by ensuring coordination of work between them.
- ❖ **Analytical:** It will provide the entire data at one place with GIS-based spatial planning, enabling better visibility to the executing agency.

For this, spatial planning tools with ISRO imagery developed by BiSAG-N (Bhaskaracharya National Institute for Space Applications and Geo-informatics) will be leveraged.

- ❖ **Dynamic:** All ministries and departments will now be able to visualise, review and monitor the progress of cross-sectoral projects.

Significance

- **Institutionalizing holistic planning for stakeholders:** Instead of planning and designing separately in silos, the projects now will be designed and executed with a common vision.
- **Integrated and seamless connectivity**: The multi-modal connectivity will facilitate the last mile connectivity of infrastructure and also reduce travel time for people.
- **Better feedback and review mechanism:** The GIS platform will give on-ground progress of the projects, helping find important interventions to improve and update the Master Plan.
- **Easy planning and execution of projects:** Each department now has an overview on the actions of each other that provide crucial information during the complete planning and execution of projects.
- **Improves Ease of Living as well as Ease of Doing Business:** It will provide information on the upcoming connectivity projects to the public and to the business community so that investors can plan their enterprises at appropriate places.
- Creating multiple employment opportunities
- **Boosting the Indian economy:** By reducing logistics costs and strengthening supply chains it will boost the global competitiveness of local products and help India become an attractive investment destination.

A Giant Stride in India's $5 Trillion Economy Goal

Gati Shakti National Master Plan

Multimodal Connectivity Infrastructure to various Economic Zones

Targets upto 2024-25 for Ministry of Shipping

Increase in Cargo capacity at the Ports to 1,759 MMTPA from 1,282 MMTPA in 2020

Cargo movement on all National Waterways will be 95 million MT from 74 million MT in 2020

Cargo movement on Ganga to be increased from 9 to 29 million MT

4.3 ELECTRICITY ACT 2003

Why in News: Recently, the Ministry of Power, Government of India, notified the following rules under the Electricity Act, 2003:

- The Electricity (Promotion of generation from renewable sources of energy by addressing Must Run and other matters) Rules, 2021.
- The Electricity (Timely recovery of costs due to Change in Law) Rules, 2021.

The Electricity Act, 2003

Background:

- Before 2003, the Indian electricity sector was guided by the Indian Electricity Act, 1910; the Electricity (Supply) Act, 1948 and the Electricity Regulatory Commission Act, 1998.
- In various States, the generation, distribution and transmission were carried out mainly by the State Electricity Boards.
- Due to the politico-economic situation, the cross-subsidies reached an unsustainable level.
  - The Electricity Regulatory Commissions Act was enacted in 1998 for the purpose of removing state governments from tariff determination.
  - To reform the electricity sector further by participation of the private sector and to bring in competition, the Electricity Act was enacted in 2003.

About the 2003 Act

- It is an Act of the Parliament of India enacted to transform the power sector in India.
- The act covers major issues involving generation, distribution, transmission and trading in power.

Some of the key features

- Generation is being de-licensed and captive generation freely permitted.
  - Now any generating company may establish, operate and maintain a generating station without obtaining a license under.
  - The only exception is that it should comply with the technical standards relating to connectivity with the grid.
  - However, hydro-projects need concurrence from the Central Electricity Authority (CEA).

- Distribution in rural areas is being de-licensed and brings in a licensing regime for distribution in urban areas. However, only 16 states in India have notified what constitutes rural areas and therefore the rural distribution is yet to be freed up in nearly one third of the country.
- No person shall transmit, distribute electricity, undertake trading in electricity, unless s/he is authorised to do so by a license issued.
- Metering of electricity supplied is made mandatory.
- The central government to prepare National Electricity Policy and Tariff Policy.
  - The act recognised the role of renewable energy in the country's National Electricity Policy and in stand-alone systems.

Background

Expanding renewable energy (RE) sector in India

- According to the CEA, India's power requirement would be 817GW by 2030, more than half of which would be clean energy and 280GW would be from solar energy alone.
- Over the past six years, around $ 4.7 trillion was spent on renewable energy in India. The investment is estimated to touch $ 1 trillion a year between now and 2030.

Issues faced by the RE sector in India

- The RE sector has been facing some obstacles over contracts with States like Punjab, Gujarat and Andhra Pradesh, who have sought to cut procurement from renewable or renegotiate power purchase agreements (PPA are long-term contracts to buy renewable energy in agreed volumes and at prices, meeting the needs of the generator and the consumer).
- These obstacles are on account of delays in land acquisition and clearances, regulatory uncertainty, inadequate grid connectivity and inordinate payment delays.

Indian solar energy projects face many issues such as higher commodity prices (like higher solar module (accounting for 60% of a solar power project's total cost) pricings) and solar power tariffs.

- Any price increases will affect the internal rates of return (IRR is the amount of profit an investor gains by investing in a solar energy system) for these projects, many of which have already signed PPAs.
- With India having strict deadlines for commissioning, failing to comply will lead to penalties for developers.

- The investors and other stakeholders in the power sector had been concerned about the timely recovery of the cost due to change in law.

About the New Rules

The Electricity (Promotion of generation from renewable sources of energy by addressing Must Run and other matters) Rules, 2021:

- It classifies RE power plants - solar, wind and hydro - as "must-run" plants.
- The electricity supply from must-run plants can only be curtailed in the event of technical constraints in the electricity grid or for reasons of security of the grid.
- The procurers of electricity will be required to pay "must-run" plants as per PPAs in case supply is curtailed.

Significance: These rules will help in achieving the targets of RE generation, ensuring that the consumers get green and clean power and secure a healthy environment for the future generation.

The Electricity (Timely recovery of costs due to Change in Law) Rules, 2021:

- It is aimed at ensuring timely recovery of the costs for generators due to change in law.
- The rules provide a formula for the adjustment in the monthly tariff due to changes in law.
- **Significance:** Timely recovery of the costs due to change in law is very important as the investment in the power sector largely depends upon timely payments.

4.4 SWAMIH FUND

Why in News: The government-backed Special Window for Affordable & Mid-Income Housing (SWAMIH) Fund has announced complete exit from its investments made in a housing project in Mumbai, Maharashtra.

SWAMIH Fund

- SWAHIM Fund is a government-backed fund, set up as a Category-II AIF (Alternate Investment Fund) debt fund registered with SEBI.
- Alternative Investment Fund means any fund which is a privately pooled investment vehicle which collects funds from sophisticated investors, whether Indian or foreign, for investing it in accordance with a defined investment policy for the benefit of its investors.

- The Investment Manager of the Fund is SBICAP Ventures, a wholly-owned subsidiary of SBI Capital Markets, which in turn is a wholly-owned subsidiary of the State Bank of India.
- The Sponsor of the Fund is the Secretary, Department of Economic Affairs, Ministry of Finance.
- The total commitment of funds to be infused by the Government in the affordable and middle-income group housing sector through the Special Window would be up to Rs. 10,000 cr.
- The maximum finance for any single project is Rs. 400 crore.

Special Window for Affordable & Mid-Income Housing (SWAMIH) Scheme

In November 2019, the Central Government had launched the SWAMIH Scheme.

Objectives:

- To provide priority debt financing for the competition of stalled housing projects falling under the affordable and middle-income housing categories.
- To provide relief to real estate developers that requires funding to complete their unfinished projects and consequently ensure the timely delivery of homes to the buyers.

- It is expected that the scheme will aid the growth of real estate sector in India.
- About 1,509 housing projects comprising approximately 4.58 lakh housing units fulfill the eligibility criteria to benefit from the scheme.
- **Eligibility:** Funding shall be provided to the projects that meet the following criteria:

- Stalled for lack of adequate funds
- Affordable and Middle Income Category
- Net worth positive projects
- RERA (Real Estate Regulatory Authority) registered
- Priority for projects very close to completion

Affordable and Mid-Income Housing Project

The Central Government has defined an 'affordable and middle-income projects' as those projects in which the flats do not measure more than 200 square meters in carpet area and are priced as below:

- Up to Rs. 2 crore in the Mumbai Metropolitan Region;
- Up to Rs. 1.5 crore in the National Capital Region, Chennai, Kolkata, Pune, Hyderabad, Bangalore and Ahmedabad

- Up to Rs. 1 crore in rest of India.

News Update

The government-backed Special Window for Affordable & Mid-Income Housing (SWAMIH) Fund has announced complete exit from its investment made in Rivali Park Wintergreen project in Mumbai. Here, 'Complete Exit' from the project means:

- Completion of the project and
- Redeeming the investment successfully.

Located in Borivali, Mumbai, the Rivali Park residential project was the first to receive funding under the SWAMIH Fund. According to the Finance Ministry, SWAMIH has given final approval to 95 other projects, sanctioning more than Rs 9,500 crore to complete over 57,700 homes.

Significance

- The successful completion of the project would embolden the SWAMIH Fund to take exposure to more such projects which are stuck due to lack of funding.
- It would help unlock liquidity in the real estate sector and provide a boost to core industries such as cement and steel.
- The money realised through this investment can now be used to support other projects.

SCIENCE AND TECHNOLOGY

❖ **Paper III: The articles in this section are relevant to the following topics:**

- **Science and Technology- developments and their applications and effects in everyday life**
- **Achievements of Indians in science & technology; indigenization of technology and developing new technology.**
- **Awareness in the fields of IT, Space, Computers, robotics, Nano-technology, bio-technology and issues relating to intellectual property rights.**
- **Prelims**

5.1 WHITE DWARFS

Why in News: Recently, an international team of astronomers has reported a unique phenomenon in a White Dwarf, about 1,400 light years from Earth.

White Dwarfs

- A white dwarf is a star at the very end of its life.
- It occurs when nuclear core fusion ceases in a small-to-average-sized main sequence star.
- A white dwarf is very tiny (for a star), very dense, and very hot as it begins the long cooling process.

Formation of a White Dwarf

The life and death of a star
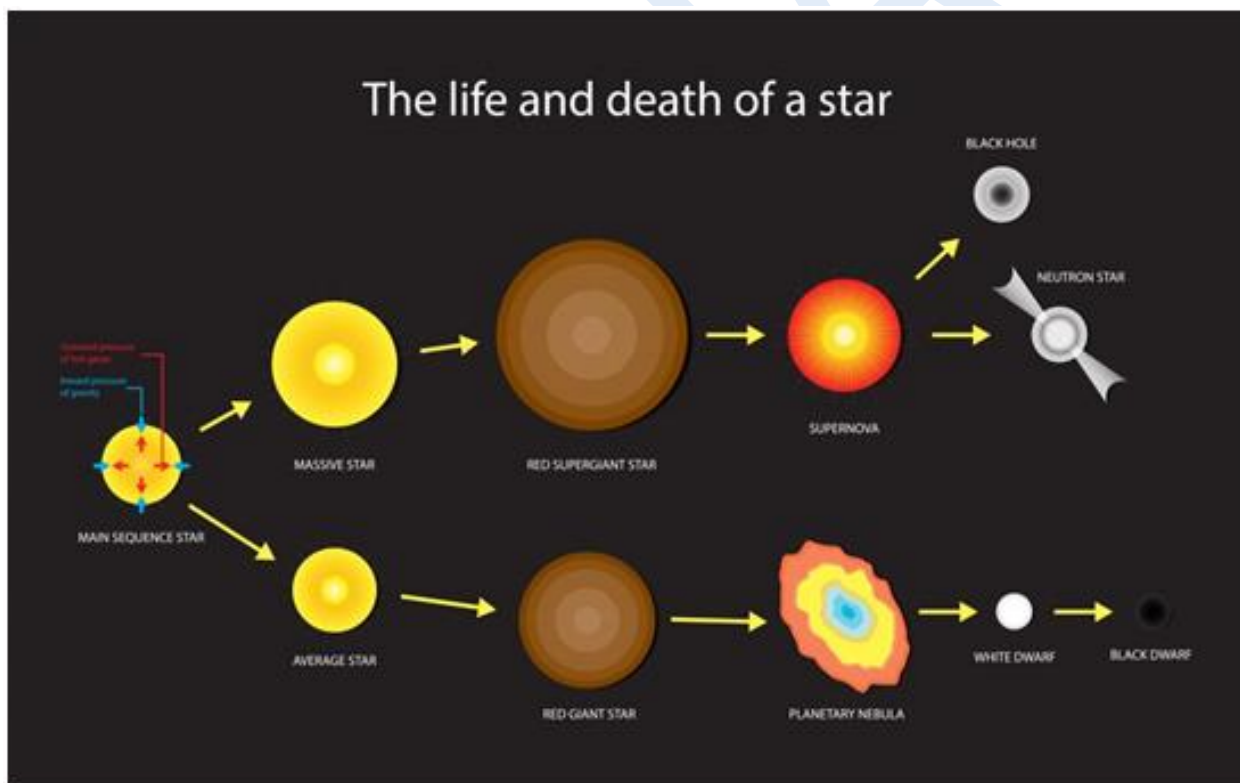
- Nearly all stars (97%) will eventually become white dwarf stars, but before a star becomes a white dwarf, it must pass through various stages of life.
- How stars evolve through their lifetime, depends on their mass.
  - The most massive stars, with eight times the mass of the Sun or more, will never become white dwarfs.

- Instead, at the end of their lives, they will explode in a violent supernova, leaving behind a neutron star or black hole.
- Low-to-medium mass stars, such as the Sun, will first swell up into **red giants.**

    - After that, the stars shed their outer layers into a ring known as a planetary nebula.
    - The core that is left behind will be a white dwarf, a star in which no hydrogen fusion occurs.

Characteristics

- When a star runs out of fuel, it no longer experiences an outward push from the process of fusion and it collapses inward on itself.
- White dwarfs contain approximately the mass of the Sun but have roughly the radius of Earth.
- This makes them among the densest objects in space, only behind neutron stars and black holes.
- According to NASA, the gravity on the surface of a white dwarf is 350,000 times that of gravity on Earth.
- White dwarfs reach this incredible density because they are collapsed so tightly that their electrons are smashed together, forming what is called "degenerate matter".
- Their small size makes white dwarfs difficult to find. No white dwarfs can be seen with naked eyes.
- Using the Hubble Space Telescope and Transiting Exoplanet Survey Satellite (TESS), astronomers have identified several white dwarfs over the years.

News Summary

- Using NASA's TESS, an international team of astronomers has reported a unique phenomenon in a white dwarf about 1,400 light years from Earth.
- The researchers were able to watch as the white dwarf switched on and off, turning bright and then dark.
- The white dwarf is part of a Binary Star System called TW Pictoris, where a star and a white dwarf orbit each other.
- The white dwarf observed by researchers is known to be accreting, or feeding, from the orbiting companion star.
- As the white dwarf accretes - it becomes brighter.

- It was seen to lose brightness in 30 minutes, a process only previously seen to occur in accreting white dwarfs over a period of several days to months.
- The team of researchers hope the discovery will help them learn more about the physics behind Accretion - where objects like black holes, white dwarfs and neutron stars feed on surrounding material from neighbouring stars.

Binary Star Systems

- In astronomy, a binary system is one that consists of two stars that are gravitationally bound.
- The two stars follow Kepler's laws of motion, and orbit their common centre of mass in elliptical or circular orbits, as shown in the figure below.
- The brighter star is officially classified as the primary star, while the dimmer of the two is the secondary (classified as A and B respectively).
  - The closest star system to Earth — Alpha Centauri — includes a binary pair of stars, Alpha Centauri A and Alpha Centauri B.
- Binary star systems provide the best means for scientists to determine the mass of a star.

5.2 HYPERSONIC WEAPON

Why in News: According to a report (London-based Financial Times), China recently tested a nuclear-powered hypersonic glide vehicle that has circled the globe before moving towards its target.

Hypersonic Weapons

Hypersonic speed: In aerodynamics (study of motion of air), a hypersonic speed is one that exceeds 5 times the speed of sound (= 343 meter per second in air), starting at speeds of Mach 5 and above.

The ratio of the speed of an object to the speed of sound (in the same medium) is called the object's Mach number. Missiles moving at or above Mach 5 speed are known as hypersonic weapons.

Types of hypersonic weapons: On the basis of necessary thrust (required to propel themselves to distant targets) they produce, hypersonic weapons can be classified as boost-glide weapons and hypersonic cruise missiles.

Boost-glide missiles: They consist of gliding vehicles mounted on the front of rocket boosters, much like those that launch spacecraft into orbit.

How it flies

1 DF-ZF is boosted to near orbital speed

3 RCS and aero controls are used for re-entry into upper atmosphere

5 Manoeuvres test aerodynamic performance

2 It uses Reaction Control System (RCS) to orient itself

4 A pull-up manoeuvre to control speed and altitude is performed

6 It dives into the target

SCMP
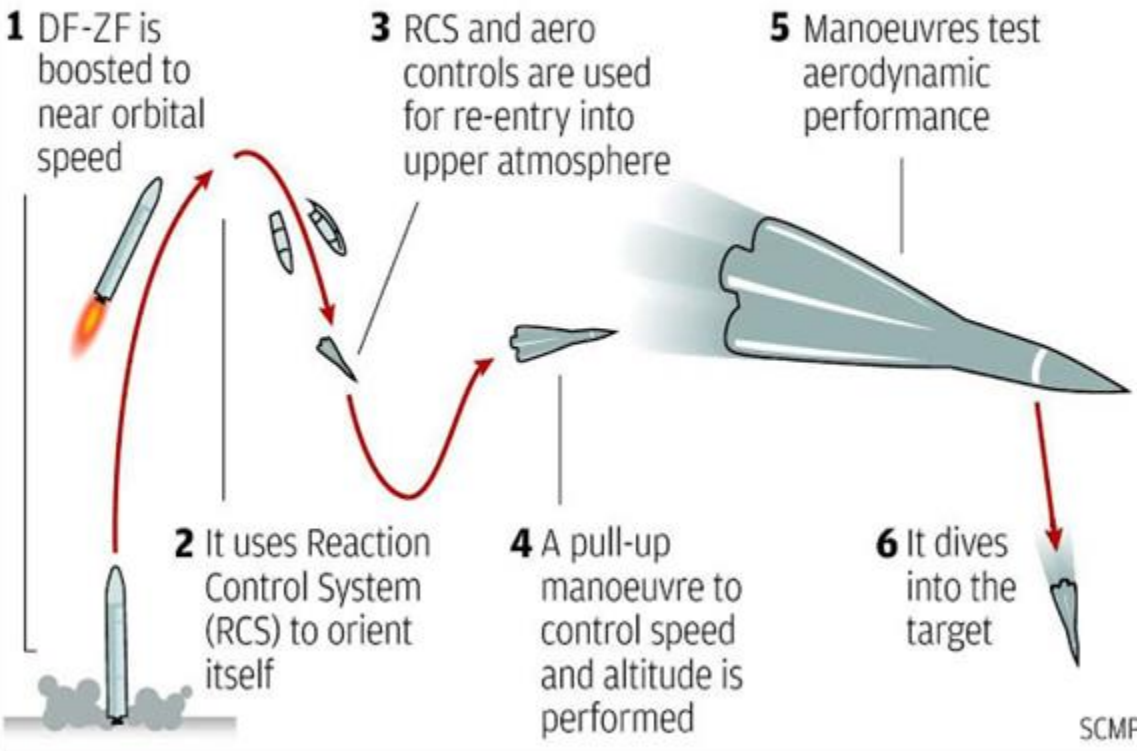
- These boosters contain large quantities of propellant (fuel and a chemical oxidizer), required to accelerate the missile to high speeds.
- Once they run out of propellant (after a few minutes into flight), these rockets detach from the glider and fall back to Earth.
- The glider continues towards its target in unpowered flight (without an engine or propellant), taking advantage of aerodynamic forces to generate lift and maneuver.
- Because boost-glide weapons carry their rocket boosters for only a short time, these boosters can be quite large and heavy.
- The use of large rockets allows boost-glide weapons to achieve very high speeds (up to more than 20 times the speed of sound), making them the fastest hypersonic weapons.

Some examples of Boost-glide weapons: The US, Russia and China are all developing hypersonic weapons, including glide vehicles.

- Russia's Avangard, an intercontinental-range hypersonic boost-glide missile, is deployed as a nuclear-armed system.

- China's DF-17 missile, which carries the DF-ZF hypersonic glider, is designed to carry either conventional or nuclear explosives (according to sources).

Boost-glide weapons v. Hypersonic cruise missiles:

Hypersonic cruise missiles carry their engines with them for the duration of their flight. Hence, these engines must be relatively small and light, limiting the maximum speeds (up to around 10 times the speed of sound) these missiles can attain.

Hypersonic cruise missiles use air breathing engines (scramjets - supersonic combustion ramjets), continuously drawing nearby air, which then reacts with fuel through combustion. Therefore, hypersonic cruise missiles need not carry oxidizer nor do they need to actively compress incoming air (done by rapid forward motion).

As compared with rocket boosters, scramjets are a less-developed technology, most deployed hypersonic weapons will likely be of the boost-glide variety in the near future.

Boost-glide weapons v. ballistic missiles:

- Like hypersonic boost-glide weapons, ballistic missiles are accelerated on the front of rocket boosters that detach once they run out of propellant and proceed through the remainder of their trajectories in unpowered flight.
- Because ballistic missiles and hypersonic boost-glide weapons are launched on similar or identical rockets, they reach the same maximum speeds.
- The primary area in which these two classes of missile technology differ is in flight altitude. After booster burn-out, ballistic missile reentry vehicles continue high (1000 km approx.) into outer space on a trajectory controlled almost entirely by gravity.
- Hypersonic gliders, on the other hand, dive back into the atmosphere early in flight and glide through the atmosphere at altitudes of tens of kilometers. This allows for more direct flight to their targets than ballistic missiles can achieve, since gliders stay close to Earth's surface. However, low altitude flight also subjects them to atmospheric drag.

Effective defense systems against hypersonic weapons: Any missile, which travels at high speed and is designed to fight interceptors, be it a ballistic missile or a hypersonic weapon, is likely to bypass existing defense systems.

The significance of China testing a hypersonic glide vehicle:

Exploration of outer space: Space planes traveling through outer space and gliding within a planetary atmosphere, can enable the safe return of space missions to Earth and reuse of the

vehicle for future missions. For example, the US Space Shuttle, which carried out numerous hypersonic reentries.

Challenging the US dominance: According to the report, the weapon tested by China could fly over the South Pole, posing a big challenge for the US military, as its missile defense systems are focused on the northern polar route.

Implications for India:

Threat to India's space assets: India must undoubtedly look closely at this test by China, because such capacity can put India's space assets and surface assets at risk.

Need to speed up development of hypersonic technologies: India too is working on hypersonic technologies, which has been developed and tested by both DRDO and ISRO, which could be further sped up. For example,

- India has already proved its capabilities (as far as space assets are concerned) through the test of ASAT.
- DRDO successfully flight-tested the Hypersonic Technology Demonstrator Vehicle (HSTDV), with a capability to travel at 6 times the speed of sound.
- The successful demonstration of the scramjet engine, opened opportunities in many critical technologies such as aerodynamic configuration for hypersonic maneuvers, etc.
- An advanced Hypersonic Wind Tunnel (HWT) test facility of the DRDO was inaugurated (in Hyderabad), which is a pressure vacuum-driven jet facility that simulates Mach 5 to 12.

Developing defense systems: The missile system operating at these speeds would mean a requirement to develop defense systems at these speeds.

5.3 INDIAN SPACE ASSOCIATION

Why in News: Prime Minister of India has formally launched the Indian Space Association - an industry body of government and private companies to boost commercial space exploration and space-based communication.

News Update

- The Indian space industry has so far been dominated by Indian government and government institutions, but now the government is enabling the private sector to propel the ecosystem to accelerate and grow the space industry.

- The Prime Minister noted that India's efforts, including that of ISRO, IN-SPACe and ISpA, should be to take solid action and support large-scale development of enterprises, strengthen technology and research and promote commercial space, ensuring sustained development of key components and exhibition activities.

The Indian Space Association (ISpA)

The Indian Space Association is a premier industry association of space and satellite companies.

Objective

- ISpA aims to be a forum of the space industry in the Indian private sector and partner the Government of India and other key stakeholders across space industry segments in making the nation self-reliant in the area as well as to become a global service provider.
- ISpA is represented by leading home grown and global corporations with advanced capabilities in the space and satellite technologies.
- It represents various stakeholders in the Indian space domain with members comprising the Indian Space Research Organization (ISRO), Bharati Airtel, OneWeb, Tata Group's Nelco, L&T, Map My India among others.

Functions

- ISpA will engage with stakeholders across the ecosystem for the formulation of an enabling policy framework that fulfils the Government's vision of Atmanirbhar Bharat.
- ISpA will also work towards building global linkages for the Indian space industry to bring in critical technology and investments into the country to create more high skill jobs.

Significance

According to ISRO, the current size of the global space economy stands at about USD 360 billion.

- However, India accounts for only about 2% of the space economy with a potential to capture 9% of the global market share by 2030.
- While India has made progress in the space sector over the years, ISRO has primarily been at the centre of this progress.
- Along the lines of the US, several private sector companies, both global and domestic, are now taking keen interest in India's space domain.
- Launching ISpA will help in liberalizing the Indian space market and have more private companies use the facilities of ISRO for developing as well as launching satellites.

The Indian National Space Promotion and Authorization Center (IN-SPACe)

- IN-SPACe is an independent nodal agency under Department of Space (DoS) for allowing space activities and usage of DoS owned facilities by non-governmental private entities (NGPEs) as well as to prioritize the launch manifest.
- As a part of space sector reforms in June 2020, the Government of India had set up the IN-SPACe.

Objective: To ensure greater private participation in India's space activities.

- IN-SPACe intends to open up the space sector and make space-based applications and services more widely accessible to everyone.
- It will act as an interface between ISRO and private parties, and assess how best to utilise India's space resources and increase space-based activities.
- It will assess the needs and demands of private players, including educational and research institutions, and, explore ways to accommodate these requirements in consultation with ISRO.
- IN-SPACe is the second space organisation created by the Government in the last two years.
- In 2019 Union Budget, the Central Government had announced the setting up of a New Space India Limited (NSIL).

New Space India Limited (NSIL)

- NSIL is a Public Sector Undertaking (PSU) set up to serve as a marketing arm of ISRO.
- It is a wholly owned Government of India company, under the administrative control of Department of Space.

Objective: To market the technologies developed by ISRO and bring it more clients that need space-based services.

While ISRO's existing commercial arm Antrix Corporation will handle ISRO's commercial deals for satellites and launch vehicles with foreign customers, the NSIL will deal with capacity building of local industry for space manufacturing.

ECOLOGY and ENVIRONMENT

❖ **Paper III: The articles in this section are relevant to the following topics:**

- **Conservation, environmental pollution and degradation, environmental impact assessment**
- **Disaster and disaster management.**

❖ **Prelims Oriented Questions**

6.1 MISSION SAMUDRAYAN

Why in News: Recently, the Ministry of Earth Sciences, Government of India, launched India's First Manned Ocean Mission Samudrayan - a part of the Deep Ocean Mission, at Chennai.

Significance of oceans

- Though oceans cover 70% of the globe, about 95% of the Deep Ocean remains unexplored.
- Oceans are also a storehouse of food, energy, minerals, and medicines, modulator of weather and climate and supports life on Earth.
- Considering the importance of the oceans on sustainability, the United Nations (UN) has declared the decade (2021-2030) as the Decade of Ocean Science for Sustainable Development.

India has a unique maritime position

- India with a 7517 km long coastline encircles 9 coastal states and 1382 islands and supports 30% of the country's population.
- As India is surrounded by the oceans from three sides, the ocean is a major economic factor supporting fisheries and aquaculture, tourism, livelihoods and blue trade.
- As a result, the Government of India's Vision of New India by 2030 (announced in 2019) highlighted the Blue Economy as one of the ten core dimensions of growth.
- Blue economy is a term in economics relating to the exploitation, preservation and regeneration of the marine environment.

Deep Ocean Mission

- With a view to explore the deep ocean for resources and develop deep sea technologies for sustainable use of ocean resources, the Cabinet Committee on Economic Affairs approved the "Deep Ocean Mission" in 2021.
- It will be a mission mode project (to be implemented in a phased manner) to support the Blue Economy Initiatives of the Government of India and the Ministry of Earth Sciences will be the nodal Ministry implementing this multi-institutional ambitious mission.
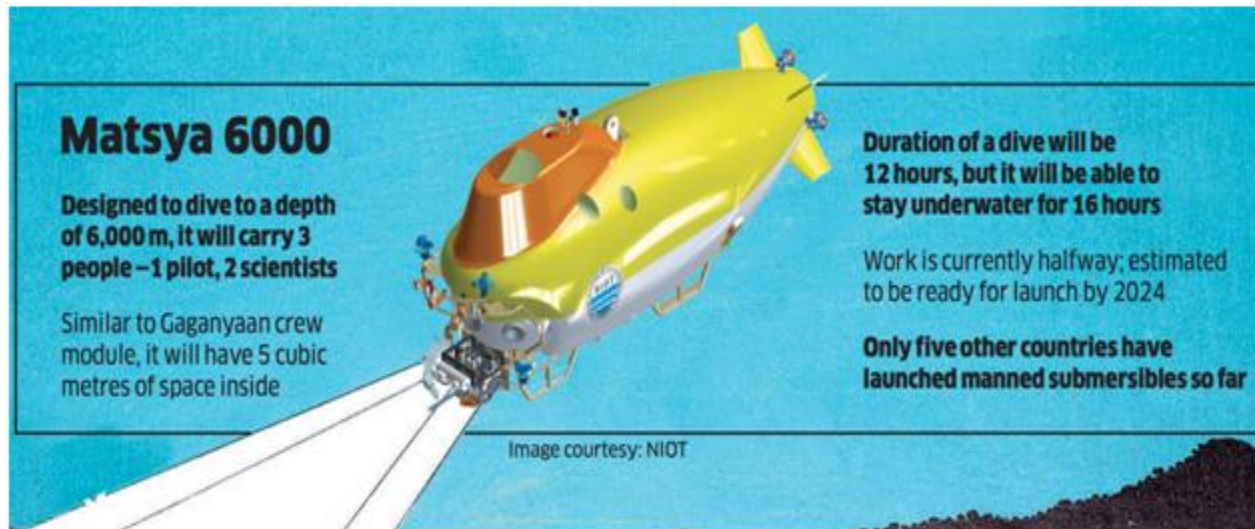
It consists of the following six major components:

- Development of Technologies for Deep Sea Mining and Manned Submersible
- Development of Ocean Climate Change Advisory Services

- Technological innovations for exploration and conservation of deep-sea biodiversity
- Deep Ocean Survey and Exploration
- Energy and freshwater from the Ocean
- Advanced Marine Station for Ocean Biology

Samudrayan Mission

Matsya 6000

Designed to dive to a depth of 6,000 m, it will carry 3 people – 1 pilot, 2 scientists

Similar to Gaganyaan crew module, it will have 5 cubic metres of space inside

Duration of a dive will be 12 hours, but it will be able to stay underwater for 16 hours

Work is currently halfway; estimated to be ready for launch by 2024

Only five other countries have launched manned submersibles so far

Image courtesy: NIOT

- The mission is undertaken by the National Institute of Ocean Technology (NIOT) in collaboration with the Indian Space Research Organisation (ISRO) and it will be a part of the Deep Ocean Mission.
- While ISRO is developing the design of the submersible, NIOT is developing its basic structure, electronics and lifesaving systems.
- Under the mission, the deep-sea vehicle - Matsya 6000, is designed to carry three people in a titanium alloy personnel sphere of 2.1-metre diameter enclosed space.
- Matsya 6000 vehicle is basically a platform to carry any devices, sensors, etc, to deep-sea for doing experiments or observations in the presence of a human being.
- It will facilitate carrying out deep ocean exploration of non-living resources such as polymetallic manganese nodules, gas hydrates, hydro-thermal sulphides and cobalt crusts.
- The sea trials of the shallow water version (500 meters) of the manned submersible are expected to take place by the end of 2022 and the deep-water version - MATSYA 6000 (1000-6000 meters) by 2024.

Significance of the launch of this Unique Ocean Mission:

- **India joins the elite club of nations:** India becomes the sixth nation after the USA, Russia, Japan, France and China to have such underwater vehicles for carrying out subsea activities (biodiversity assessment, geo-scientific observation, etc).
- **Will augment India's capability:** The mission will help in developing infrastructure facilities such as a high thickness welding facility, deep ocean simulator, in Marine Biology, enabling the growth of the Indian industry, especially the MSME and Start-ups.
- **Strategic implications and are not commercially available:** For example, a research vessel for deep ocean exploration would be built in an Indian shipyard, creating employment opportunities.
- **Opportunities ahead:** The advancing technologies in metallurgy, energy storage, underwater navigation and manufacturing facilities provide opportunity for developing more efficient, reliable and safe manned submersibles. For example, the Fendouzhe manned submersible developed by China in 2020 has touched about 11000 meters, with the advancing subsea technologies.

6.2 MAPPING INDIA'S CLIMATE VULNARABILITY

Why in News: Council on Energy, Environment and Water (CEEW), a public policy think tank, has published a report titled 'Mapping India's Climate Vulnerability'.

About the Report

- The report titled 'Mapping India's Climate Vulnerability' undertakes a District-level Vulnerability Assessment of India.
- To perform this assessment, the study has developed a Climate Vulnerability Index.

Climate Vulnerability Index (CVI)

- The CVI computes the vulnerability score of each district by taking into consideration three components of the vulnerability function: exposure, sensitivity, and adaptive capacity.
- The Index will help Map critical vulnerabilities; Plan strategies to enhance resilience, and adapt by climate-proofing communities, economies and infrastructure.
- The CVI also helps map the vulnerability of populations residing in Indian districts.
- In the Index, the score of 1 represents extreme vulnerability and 0 indicates no vulnerability to floods, droughts and cyclones.

Major Findings of the Report

- India ranks seventh in the word in terms of vulnerability to climate extremes.

- More than 75 per cent of Indian districts are extreme event hotspots for hydro-met disasters like floods, droughts, and cyclones and their associated events.
- More than 40 per cent of these districts are showcasing a swapping trend, i.e., flood-prone areas are becoming drought-prone and vice versa.

Flood Vulnerability

- The state of flood events in India is abrupt and non-linear.
- The frequency and intensity of extreme events are surging.
- More than 60 per cent of Indian districts are extreme flood event hotspots.
- The north-eastern zone – including Assam, Manipur, Sikkim, and Arunachal Pradesh – is highly exposed to extreme flood events.

Drought Vulnerability

- 68 per cent of Indian districts are exposed to extreme drought events.
- Especially, India's southern and central zones are highly exposed to extreme drought events.
- The states with maximum exposure to extreme drought events are Rajasthan, Andhra Pradesh, Maharashtra, Karnataka, and Tamil Nadu.

Cyclone Vulnerability

States like Andhra Pradesh, Karnataka, Bihar, Odisha, and Maharashtra are the most exposed to extreme cyclones and associated events.

Overall Vulnerability Index

27 of 35 states and UTs in India are highly vulnerable to extreme hydro-met disasters and their compounded impacts.

The following table highlights the 5 most vulnerable states in India, as per the Climate Vulnerability Index:

Major Recommendations: The report has made five key recommendations for building a climate-resilient India:

- Develop a Climate Risk Atlas (CRA)
- Establish a Climate Risk Commission (CRC) to mainstream climate risks in a de-centralized manner
- Restore the landscape to rehabilitate and reintegrate natural ecosystems

- Build climate risk–informed infrastructure across the country
- Integrate climate vulnerability index–based financing instruments into investment decision-making

The Council on Energy, Environment and Water (CEEW) is one of Asia's leading not-for-profit policy research institutions. The CEEW is based in New Delhi.

6.3 EMISSIONS GAP REPORT

Why in News: The United Nations Environment Program (UNEP) has launched the Emissions Gap Report 2021.

Emissions Gap Report

- Each year, the Emissions Gap Report is published by the United Nations Environment Program (UNEP). 2021 report is the twelfth edition of this report.
- The UNEP is the leading environmental authority in the United Nations system. It was established in 1972.
- It is Head quartered in Nairobi, Kenya.

UNEP categorizes its work into seven broad thematic areas:

Climate change, disasters and conflicts, ecosystem management, environmental governance, chemicals and waste, resource efficiency, and environment under review.

The report provides an updated assessment of the gap between:

- Estimated future global GHG emissions if countries implement their climate mitigation pledges and
- The global emission levels from least-cost pathways that are aligned with achieving the Paris Agreement goal of limiting global warming to well below 2°C and pursuing 1.5°C.

This difference between where we will likely be and where we need to be is now well known as the 'emissions gap'.

Summary of Emission Gap Report 2021

- In a high-level online press event with UN Secretary-General, the UNEP released the Emissions Gap Report 2021.
- **The title of the report is - Emissions Gap Report 2021: The Heat Is On**

- Current path would lead to catastrophic changes in the Earth's climate. New national climate pledges combined with other mitigation measures put the world on track for a global temperature rise of 2.7°C by the end of the century.
- That is well above the goals of the Paris climate agreement and would lead to catastrophic changes in the Earth's climate.

Net-zero pledges could make a big difference

Global greenhouse gas emissions under different scenarios and the emissions gap in 2030 (median estimat and tenth to ninebeth percentile range)
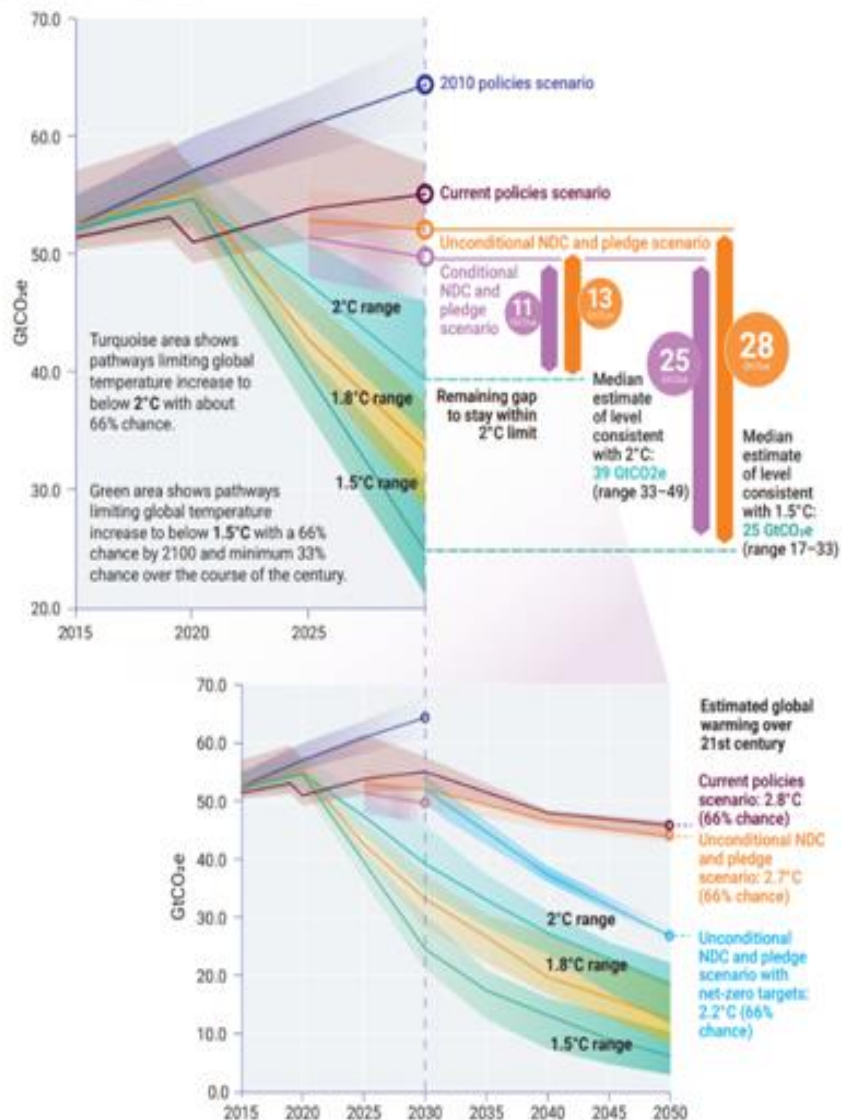
If implemented effectively, net-zero emissions pledges could limit warming to 2.2°C, closer to the well-below 2°C goal of the Paris Agreement. However, many national climate plans delay

action until after 2030. Also, net-zero pledges are still vague, incomplete in many cases, and inconsistent with most 2030 NDCs.

The world has eight years

- To have any chance of limiting global warming to 1.5°C, the world has eight years to take an additional 28 giga tonnes of CO2 equivalent (GtCO2e) off annual emissions.
- This is over and above what is promised in the updated NDCs and other 2030 commitments.

The potential of methane and market mechanisms: The reduction of methane emissions from the fossil fuel, waste and agriculture sectors could help close the emissions gap and reduce warming in the short term.

- Methane emissions are the second largest contributor to global warming.
- The gas has a global warming potential over 80 times that of carbon dioxide over a 20-year horizon.
- It also has a shorter lifetime in the atmosphere than carbon dioxide.
- Hence, cuts to methane will limit temperature increase faster than cuts to carbon dioxide.
- Implementation of all measures, along with broader structural and behavioural measures, could reduce anthropogenic methane emissions by approximately 45%.
- Carbon markets could also help slash emissions. But that would only happen if rules are clearly defined and target actual reductions in emissions.
- Revenues earned through these markets could fund mitigation and adaptation solutions domestically and in vulnerable nations.

COVID-19 recovery opportunity largely missed

- The opportunity to use COVID-19 fiscal rescue and recovery spending to stimulate the economy while backing climate action has been missed in most countries.
- The COVID-19 pandemic led to a drop in global CO2 emissions of 5.4 per cent in 2020. However, CO2 and non-CO2 emissions in 2021 are expected to rise again to a level only slightly lower than the record high in 2019.

COVID-19 spending has been far lower in low-income economies (USD 60 per person) than advanced economies (USD 11,800 per person). Gaps in finance are likely to exacerbate gaps in vulnerable nations on climate resilience and mitigation measures.

6.4 AGENDA FOR COP26

Why in News: The 26th Conference of Parties (COP26) under the United Nations Climate Change Framework Convention (UNFCCC) is going to be held (from Oct 31 - Nov 12) in Glasgow, United Kingdom (UK).

The annual climate conference managed to motivate the world to take collective action to fight climate change, but in the previous two decades they were unable to prevent the crisis from worsening.

COP26

The COP26 had to take place last year, but it was to be postponed (for the first time in its history) because of the pandemic.

Agenda for COP 26: According to the UNFCCC, COP26 will work towards four goals -

- Secure global net-zero emissions by mid-century and keep 1.5 degrees within reach,
- Adapt to protect communities and natural habitats,
- Moilise finance and
- Work together to deliver by finalising the Paris Rulebook (supposed to have been completed by 2018) that will help fulfil the Paris Agreement.

Adopting the Rulebook will provide guidance for how countries should implement and strengthen their national climate plans under the Paris Agreement.

Significance: COP26 will be a critical summit for global climate action from the following perspectives:

- A chance for members to work to limit global warming to 1.5 degrees, by reducing global emissions (by half) by 2030 and reach 'net-zero' by 2050.
- This will be in line with the 2021 IPCC report, underscoring that it is still possible to achieve the 1.5-degree-target only if unprecedented action is taken now.
- The signatories of the Paris Agreement are expected to submit new and more ambitious Nationally Determined Contributions (NDCs), as they are required to do so every five years (ratchet mechanism).
- This will help to deal with economic and non-economic harms caused by climate change impacts which cannot be avoided through adaptation or mitigation, known as 'loss and damage'.

▪ With the impacts of COVID-19, it is vitally important that all work together to scale up finance from all sources and improve access to finance.

The COP meetings - Climate targets set, missed

• Annual meeting on climate change is part of the UN-supported process that began in the early 1990s.

• This was the time when the world realised that greenhouse gas (GHG) emissions were causing an increase in the temperature that would gradually make the Earth uncomfortable to live in.

• These meetings have been remarkably successful throughout the years, putting climate change on the top of the agenda and ensuring that every government has a climate change action plan.

• **Two international agreements - the Kyoto Protocol (1997) and the Paris Accord (2015) - have been concluded in this process to reduce global GHG emissions.** However, the outcomes of these meetings could not match the scale of the response required.

Targets set and missed

EMISSION REDUCTION: TARGETS & PROGRESS

COUNTRY	EMISSION REDUCTION TARGET	STATUS IN 2018
US	26-28% by 2025 from 2005 levels	10% reduction from 2005
EU (27)	40% by 2030 from 1990 levels	22% reduction from 1990
Australia	26-28% by 2030 from 2005 levels	3.48% above 2005
Japan	25.4% by 2030 from 2005 levels	2.66% reduction from 2005
Canada	30% by 2030 from 2005 levels	24.16% reduction from 2005
Russia	25-30% reduction by 2030 from 1990	30.95% reduction from 1990
China	Peak emissions in 2030	70.57% above 2005
Brazil	37% by 2025 from 2005 levels, 43% by 2030	29.13% below 2005
Indonesia	29% by 2030 from business-as-usual scenario	37.11% above 2005
Iran	4% by 2030 from business-as-usual scenario	45.58% above 2005

A coal-fired plant in Utah, US. *NYT*

For most of the first two decades (between 1990 - 2010), very little was done to reduce the growing emissions. Though an international agreement was finalised Kyoto in 1997, it couldn't be operationalised until 2005 in the absence of the requisite number of ratifications.

For example, the U.S. (world's largest emitter at that time), did not ratify and was thus not bound by it.

- In the first commitment period (2008-2012), the Kyoto Protocol called on a group of 37 rich and industrialized countries to achieve a mild 5% cut in emissions from the 1990 levels.
- Except the European Union (EU) and some of its individual members such as Germany and the United Kingdom (then in the EU), most of the countries did not achieve the target.
- Newly growing economies such as China, India, Brazil, were not mandated to cut down their emissions, as over 90% of the accumulated GHGs emissions in the atmosphere had come from the rich and industrialised countries over the last 150 years.

- This resulted in the most demanding and empowering provision - Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC).
- While the "historical emissions" of the newly growing economies was negligible, their emissions grew at very fast pace, raising eyebrows of the developed countries (as they funded adaptation and mitigation efforts of developing countries).
- A systematic effort was therefore made to destroy the Kyoto Protocol and replace it with an architectural structure that would also establish some restrictions on emissions from countries like India and China. This led to the Paris Agreement, finalised in 2015. Now, the countries were only asked to do what they thought they were best capable of (NDCs).
- Thus, there is little motivation and no obligation for countries to push further with this arrangement.

Challenges Ahead:

Disagreement over creation of carbon markets: Carbon markets are a key tool for reducing emissions and were a part of the Kyoto Protocol.

- Under this, one way of reducing emission targets of rich and industrialized countries was by allowing these countries to purchase carbon credits from developing countries.
- On one hand, these credits could be purchased and counted on by developed countries to meet their goals, while developing countries received money to finance their shift to cleaner technologies on the other.
- The Paris Agreement also provides for carbon markets, but the developed countries are demanding robust methods to grant carbon credits that would not allow the transition of the earlier carbon credits to the new market mechanism.
- This remains the last stumbling block in the finalisation of the rules and procedures of the Paris Agreement.

Net zero or carbon neutrality not a part of Paris Accord: Carbon neutrality is a scenario that either balances a country's emissions by absorbing greenhouse gas (done by trees and forests) or by physically eliminating carbon dioxide from the environment via futuristic technologies.

The issue of net-zero or carbon neutrality does not find a mention in the Paris Agreement. More than 50 countries have pledged to carbon-neutrality by the middle of the century. For example,

- China has said it would achieve this status by 2060.
- Germany has announced a target of 2045.

India is the largest emitter that still does not have a net-zero commitment.

Like Minded Developing Countries (LMDCs - India, China, Indonesia, Malaysia, Iran, Bangladesh, etc), denounced efforts to push everyone to a net-zero target, as it is against 'equity' and 'climate justice'

Lack of money and technologies

- The developed countries were required to provide money and technology (to the developing countries) to facilitate adaptation to the changing environment.
- This was mandated not just under the Kyoto Protocol but also in the successor Paris Agreement regime.
- In 2009 (the Copenhagen conference), it was announced that the developed countries would mobilise $100 billion for developing countries every year from 2020.
- Though this promise was included in the Paris Agreement as well, the developing countries claim that there is very little money on offer.
- Moreover, $100 billion currently appears to be a small amount, since it is estimated that every year trillions of dollars are needed in climate finance.

The above-mentioned issues will be on the top of the table during the COP26 meeting.

5.5 GREEN HOUSE GAS BULLETEIN

Why in News: The U.N. World Meteorological Organization (WMO) has released the Green House Gas (GHG) bulletin.

World Meteorological Organization (WMO)

- WMO is one of the specialized agencies of the United Nations.
- Headquarter – Geneva, Switzerland

- Its supreme body is the World Meteorological Congress.

WMO originated from the International Meteorological Organization (IMO). The roots of which were planted at the 1873 Vienna International Meteorological Congress. It was established by the ratification of the WMO Convention on 23 March 1950.

Functions

WMO became the specialised agency of the United Nations for

- meteorology (weather and climate)
- operational hydrology and
- related geophysical sciences

News Update

- Ahead of the Glasgow climate summit, starting on October 31, WMO has released its annual GHG bulletin. The report found out that the economic slowdown caused by the Covid-19 pandemic did not have any noticeable impact on the concentration of GHGs in the atmosphere.
- It reached new record levels last year.

Key summary of the report

Concentration of different GHGs

Concentration of various GHGs is shown in the following diagram:

The economic slowdown from COVID-19 did not have any discernible impact on the atmospheric levels of greenhouse gases and their growth rates.

Although there was a temporary decline in new emissions.

Global temperature will continue to rise

As long as emissions continue, global temperature will continue to rise.

Given the long life of CO2, the temperature level already observed will persist for several decades even if emissions are rapidly reduced to net zero.

Less-effectiveness of Carbon Sinks in near future

Roughly half of the CO2 emitted by human activities today remains in the atmosphere. The other half is taken up by oceans and land ecosystems. The Bulletin flagged concern that the ability of land ecosystems and oceans to act as "sinks" may become less effective in future.

Hence, it will reduce their ability to absorb carbon dioxide and act as a buffer against larger temperature increase.

Message for climate change negotiators at COP26

At the current rate of increase in greenhouse gas concentrations, the earth will see a temperature increase by the end of this century. This increase will be far in excess of the Paris Agreement targets of 1.5 to 2 degrees Celsius above pre-industrial levels.

The amount of CO2 in the atmosphere breached the milestone of 400 parts per million in 2015. And just five years later, it exceeded 413 ppm. The last time the Earth experienced a comparable concentration of CO2 was 3-5 million years ago. At that time the temperature was 2-3°C warmer and sea level was 10-20 meters higher than now. But there weren't 7.8 billion people then.

5.6 INTERNATIONAL SOLAR ALLIANCE

Why in News: Recently, the fourth general assembly of the International Solar Alliance (ISA), was held virtually.

International Solar Alliance (ISA)

- ISA is a treaty based inter-governmental organization.
- It is working to create a global market system to tap the benefits of solar power and promote clean energy applications.

HQ: Gurugram

- ISA was conceived as a coalition of solar-resource-rich countries (which lie either completely or partly between the Tropic of Cancer and the Tropic of Capricorn) to address their special energy needs.
- It was launched jointly by India and France at the side-lines of COP 21 (held in Paris) in 2015.The Paris Declaration had established the ISA.

Objective

- The objective of ISA is to collectively address key common challenges to the scaling up of solar energy in line with their needs.
- To meet this objective, it aims to pave the way for future solar generation, storage and technologies for Member countries' needs by mobilising over USD 1000 billion by 2030.

Vision and Role of ISA

Vision of ISA is to enable One World, One Sun, One Grid. The ISA plays a four-fold role in establishing a global solar market: it is

- an accelerator
- an enabler
- an incubator, and
- a facilitator

News Update

Recently, India hosted the fourth general assembly of ISA in virtual mode.

It was presided by the union Minister for Power, New and Renewable Energy, and the President of the ISA Assembly.

ISA

ISA Represents:
* 73% of global population, 36% of world GDP
* 55% of total energy consumption world wide,
* 23% of installed solar capacity

What is International Solar Alliance?
It is an inter-governmental organisation to promote solar energy among member countries. It is headquartered in Gurgaon

How many have joined in?
As of now, 61 nations have joined the alliance while 32 have ratified the Framework Agreement

$83 bn
India's requirement to meet its 175 GW goal

What is the concept?
It is meant to bring together 121 countries that lie either completely or partly between the two tropics so as to harness solar energy and make the technology freely available to all nations

ISA TARGET
1,000 GW
Solar generation capacity globally by 2030
$1 trillion
Investment required to achieve the 2030 goal

Who's behind it?
The idea was conceived and articulated by Prime Minister Narendra Modi during his Wembley Stadium speech at London in 2015

175 Gigawatts (GW) generation from renewable energy is India's target for 2022

20 GW solar power capacity already installed in India, says Modi

Key Highlights

Stand of The United Kingdom

- It emphasised on the need for new transmission lines coordinated with mini grids and off-grid energy access solutions, supported by modern power systems.
- It further said that UK and India will together bring the 'Green Girds Initiative' and 'One Sun, One World, One Grid' at COP26. This is aimed at mobilizing the global technical, financial and research cooperation.

India's stand

- India emphasized that it is time for developed countries to direct the energy transitions funds they had committed at previous climate conferences.
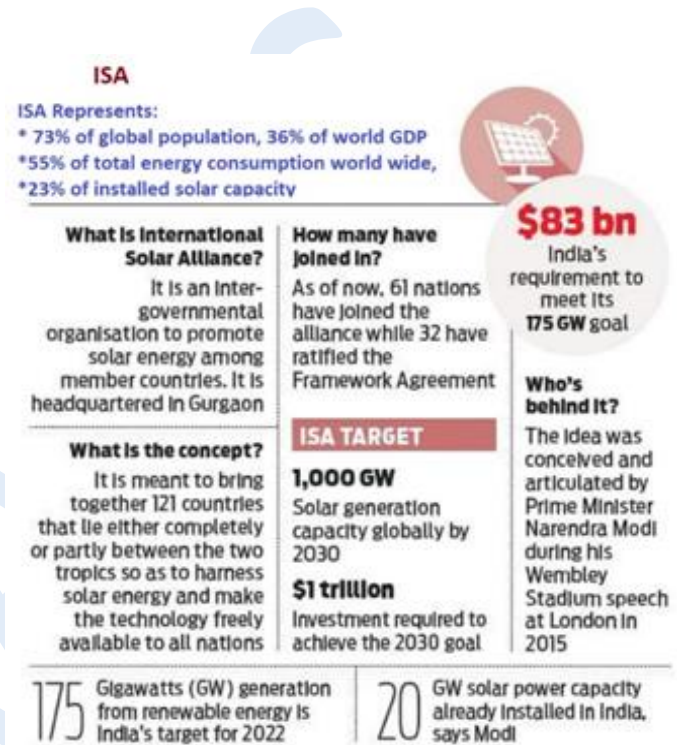
- The Energy Transition Fund aims to encourage and support research, development and innovation in the field of energy.
- Indian leader said that the ISA will cover credit guarantees and help in driving green energy investments in these countries.
- ISA targets US$1 trillion of investment in solar by 2030, which would be significant in bringing the world closer to energy transitions needed.

Key Outcomes

- Enhancing the Capacity of Women to Support Energy Transition session was conducted.
- In this session, India highlighted that it will focus more on women in our skill and capacity building programs.
- India is working on the concept of De-centralized Renewable Energy applications & proposes to turn it into a scheme in the coming months.
- The idea is to enable women to use things such as solar dryers and solar grinders etc., and enable them to earn a livelihood.

Two new programs were launched:

  ▪ Management of Solar PV panels & battery usage waste; and
  ▪ Solar Hydrogen program

- The new Hydrogen initiative is aimed at enabling the use of solar electricity to produce hydrogen at a more affordable rate. It is available currently @USD 5 per KG. The aim is to bring it down to USD 2 per KG.
- ISA's waste management program will be pivotal for the growing volume of waste & toxic materials, lack of waste specific legislation, and high cost of waste treatment.
- An update on One Sun One World One Grid (OSOWOG) initiative was also discussed.
- The concept of a single global grid for solar was first outlined at the First Assembly of the ISA in late 2018.
- It envisions building and scaling inter-regional energy grids to: share solar energy across the globe, leveraging the differences of time zones, seasons, resources, and prices between countries and regions.
- OSOWOG will also help decarbonise energy production: OSOWOG has joined hands with Green Grids Initiative (GGI) to form a unified GGI-OSOWOG initiative. It aims to contribute to the collaborative, rapid development of resilient grids globally – building on continental, regional and national grid infrastructure programs.

5.7 FOREST CONSERVATION ACT, 1980

Why in News: The Ministry for Environment, Forests and Climate Change (MoEFCC) has recently published proposed amendments to the Forest Conservation Act, 1980.

The Forest (Conservation) Act (FCA), 1980

Need for FCA: Though the Indian Forests Act is in effect since 1927, it was designed not to preserve forests or combat deforestation, but to allow the Colonial British authority to control timber extraction.

About FCA:

- The FCA is the principal legislation that regulates deforestation in the country.
- It prohibits the felling of forests for any "non-forestry" use without prior clearance by the central government.
- It is a brief legislation with only five sections - Section 1 defines the extent of coverage of the law, Section 2 restrictions of activities in forest areas and the rest deals with the creation of advisory committees, powers of rule-making and penalties.
- The clearance process includes seeking consent from local forest rights-holders and from wildlife authorities.
- The Centre is empowered to reject such requests or allow it with legally binding conditions.

Amendments to the FCA: There have been at least two major amendments (in 1988 and 1996) to the FCA.

Situation before 1996: Earlier, only lands specifically notified as forests (under the Indian Forest Act, 1927 or any other local law) were protected by the enforcement of the FCA.

T N Godavarman Thirumulpad v Union of India (1996): The Supreme Court of India (in 1996) had expanded the coverage of FCA to all areas that satisfied the dictionary definition of a forest - a large area covered chiefly with trees and undergrowth.

News Update

Recently, the Ministry for Environment, Forests and Climate Change (MoEFCC), Government of India, published proposed amendments to the Forest Conservation Act, 1980. The proposed amendments aim to ease forest diversion in some cases, and to relieve the Ministry from the need for clearance in certain categories of developments.

The proposed amendments to the FCA:

Need to amend FCA again:

Conflict between ecological and developmental needs:

- India's aim is to have at least 33% of India's geographical area under forest and tree cover.
- The fundamental issue in the FCA is that the Government is committed to a concept of increasing forest cover which makes it difficult for States and private entities to obtain land on infrastructural projects.

Conflict over legal definition of 'forest':

- To date, the forest cover is roughly 22% and since the growth of core forest land is becoming harder, the expansion methods include expanding the concept of forest land.
- With more land coming under the definition of 'forest', it is becoming harder for State Governments or private industry to use land for non-forestry purposes.

The latest amendments: The proposed amendments seek to make additions and changes to Section 1 and 2 of the FCA. Some of the proposed amendments -

Exemptions railways and roads inside forests: All land acquired by the Railways and Roads Ministries prior to 1980 be exempted from the Act. Hence, these projects neither need clearance nor pay compensatory levies.

Strategic or security projects exempted: Defence projects near international borders will be exempted from forest clearance.

Concessions to exploration: Oil and natural gas extraction from forested lands will be permitted, but only if technologies such as Extended Reach Drilling are used.

Exemptions to plantations: Strip plantations alongside roads that would fall under the Act will be exempted.

Positives associated with recent amendments:

- Using the parliamentary process: The typical approach in the last decades was to amend legislation through notifications and not through statutory process.
- Making forest laws more stringent: The proposed amendment makes stringent provisions for notified forests, making offences non-bailable with increased penalties including imprisonment of up to one year.

- Attempts to define and identify forests: At present, identification of forest land is subjective and arbitrary and the ambiguity has resulted in a lot of resentment and resistance particularly from private entities.

Concerns associated with recent amendments:

- Will facilitate corporate ownership and the fragmentation and disappearance of large tracts of forests.
- The amendment is silent on tribal and forest dwelling communities.
- Exemptions given will be detrimental to forests as well as wildlife.

Way ahead

- **Encourage private landowners to grow more trees:** This is essential as India, as part of its climate change action plan, has committed to create a carbon sink to contain 2.5 to 3 billion tones of CO2 by 2030.
- **Consult with stakeholders:** The government needs to invite and accommodate valid feedback from state governments and the general public before the amendment bill is tabled in Parliament.

SOCIAL ISSUES

❖ **Paper I: The articles in this section are relevant to the following topics:**

- **Salient features of Indian Society, Diversity of India.**
- **Role of women and women's organization, population and associated issues, poverty and developmental issues, urbanization, their problems and their remedies.**
- **Effects of globalization on Indian society**
- **Social empowerment, communalism, regionalism & secularism.**

7.1 PERFORMANCE OF DISTRICT HOSPITALS REPORT

Why in News: The NITI Aayog has released a report titled 'Best Practices in the Performance of District Hospitals'. The report is an outcome of collaboration with the Ministry of Health and Family Welfare and WHO India.

Significance of this report

Assessment framework

A total of 707 district hospitals across all states and union territories participated in the performance assessment. The Health Management Information System data for the year 2017–18 has been used as baseline for this exercise

The assessment framework covers 10 Key Performance Indicators across the domains of Structure and Output.

NITI AAYOG REPORT FINDINGS

Indian Public Health Standards 2012 guidelines recommend district hospitals to maintain at least 22 beds per 1 lakh population. These states have fewer average beds per district.

STATE	BEDS
Madhya Pradesh	20
Chhattisgarh	20
West Bengal	19
Rajasthan	19
Gujarat	19
Punjab	18
Andhra Pradesh	18
Assam	18
Jammu & Kashmir	17
Maharashtra	14
Haryana	13
Uttar Pradesh	13
Telangana	10
Jharkhand	9
Bihar	6

Key Findings

Bed availability

- A district hospital in India has on an average 24 beds per 1 lakh population.
- Bihar has the lowest average of six beds and Puducherry the highest of 222 (per 1 lakh population).
- 217 district hospitals (in 21 states and UTs) were found to have at least 22 beds for every 1 lakh population (fulfilling the guidelines of Indian Public Health Standards 2012).

Categorisation of Hospitals

- For the performance assessment, district hospitals were categorised into small (up to 200 beds), mid-sized (201-300 beds) and large hospitals (more than 300 beds).
- Of the total hospitals, 62 per cent were small.

Other findings:

Doctor-to-bed ratio

Only 27 per cent of the total 707 districts assessed met the doctor-to-bed ratio of 29 doctors per 100 beds in a hospital.

Availability of support services

- On an average, every district hospital in India had 11 support services, compared to the required 14.
- A total 101 out of 707 hospitals fulfilled the criteria of having all 14 functional specialties.
- Tamil Nadu had the highest proportion of hospitals with all functional specialties, followed by Karnataka, West Bengal and Kerala.

Availability of all diagnostic testing services

- Only 21 hospitals fulfilled the criteria of having all diagnostic testing services available.
- Karnataka had the highest proportion of hospitals with all support services, followed by Telangana, Andhra Pradesh and Gujarat.

Bed Occupancy

182 hospitals out of the 707 had bed occupancy of 90 per cent or more. Occupancy of 80-85 per cent is considered ideal. At an average a doctor in a district hospital attends to 27 OPD patients.

Currently, there are more than 800 district hospitals across the country providing crucial services to the population. These hospitals play a pivotal role in creating healthier communities, providing a wide spectrum of healthcare services that caters to all individuals of the population.

These hospitals hold significance in order to make health for all a reality and to ensure that every citizen has access to safe and reliable health services.

Significance of this report

- This report is the first-ever performance assessment of district hospitals undertaken across the country.
- It can serve as a foundation for a roadmap of action for developing upgraded and improved district hospitals in the country.
- It also marks a major shift in the healthcare delivery system towards data-driven governance.

7.2 SAGE INITIATIVE

Why in News: Recently, the senior care Ageing Growth Engine (SAGE) initiative of the Government of India started with the selection of 9 start-ups for their innovative product and services for senior citizens as a first step to develop the 'silver economy.'

Also, the Government of India launched the Senior Able Citizens for Re-Employment in Dignity (SACRED) - an e-employment exchange for the elderly.

'Silver Economy'

- 'Silver Economy' includes all those economic activities, products and services designed to meet the needs of senior citizens (persons above 60 years of age in India).
- In social gerontology (working with elderly), the silver economy is not evaluated as an existing economic system but as a policy or a political idea of forming a potential, needs-oriented economic system for the aging population.
- Importance in India - A steady rise in India's elderly population: The number of elderly persons in India increased from 1.98 crore (1951) to 38 crore (2011).

According to a report submitted to the National Commission on Population, the population of senior citizens in India is expected to increase to almost 74 crore by 2036 (14.9% of India's population).

Therefore, the focus of the Indian government is on creating an ecosystem that supports the needs of elderly population more holistically.

The Senior care Ageing Growth Engine (SAGE) Initiative

Background: In order to utilise the Senior Citizen Welfare Fund (SCWF created by the Government of India (GoI) in 2016), the GoI has constituted an Expert Group on the silver economy, which recommended a scheme to promote private enterprises that foster innovation in products for the benefit of the elders.

SAGE initiative

- It was launched (in 2021) by the Ministry of Social Justice and Empowerment, GoI.

300M ELDERLY BY 2050

30 years from now, the elderly population in India is expected to triple from **104 million** in 2011 to **300 million** in 2050

Elderly population in **India** (**134m** in 2020) is fast reaching the current size of population of **Mexico** (**130m**) or **Russia** (**143m**)

The 2050 population of elderly will be close to the population of the US (**326m** in 2018) today

India's **12 million** population of 80+ is equal to the total population of countries such as Belgium, Greece, or Cuba

- The Ministry also launched the SAGE portal, which will be a "one-stop access" of elderly care products and services by credible start-ups.
- The portal will also provide a transparent mechanism for selecting the start-ups that will provide innovative products to the elderly.

Objectives

- To select and encourage the "startups" based on the innovative products and services they provide to the elderly.
- To focus on addressing the needs of India's fast rising elderly population.
- To select, support and create a "one-stop access" of elderly care products and services.

Funding: The Inter-Ministerial committee for the SCWF has considered funding of about Rs. 100 crores as equity support to the selected start-ups (Rs. 1 Cr per startup maximum).

Significance

- The initiative will help in providing services to the elderly ranging from health, housing, care centers, technology access (for needs ranging from finances, food and wealth management to legal guidance).
- Will further boost the start-up ecosystem in India as India has become the world's third-largest start-up ecosystem.

The Senior Able Citizens for Re-Employment in Dignity (SACRED) Portal

It is an e-employment exchange for the elderly launched by the Ministry of Social Justice and Empowerment, GoI, and developed by the National Informatics Centre (NIC).

Objective: To bring the employment seeker senior citizens and employment providers on one platform.

Features:

- Voluntary Organizations (like Self Help Groups (SHGs)) will help the senior citizens in applying for these jobs.
- No user charges will be taken from any of the senior citizens by any Voluntary Organizations.
- The portal will not be a guarantee for getting a job or employment or selling of the products of the SHGs.
- It will act as an interactive platform where stakeholders meet each other virtually and decide on the course of action with mutual respect, consent and understanding.

Significance

- The portal will help in utilizing the experience, time and energy of many senior citizens as more than 50% senior citizens are found active (LASI report 2020).
- The portal will serve not only the senior citizens seeking employment, but also the employers, the SHGs, the senior citizens gaining skills, etc.

The SAGE initiative of the Government started with the selection of 9 start-ups for their innovative product and services for senior citizens as a first step to develop the 'silver economy.'

Innovations of some of the selected start-ups

- **Neomotion:** The start-up has come up with a no transfer accessibility solution where a user will be able to attach the wheelchair to a motorbike and travel.
- **Newnara:** It's products - Indoknee offers lightweight, unhindered corrective support; Flexmo a wearable hip guard and Ducere smart insoles for fall prevention.
- **Avyantra:** It is working to deliver an automated medical device for home dialysis that could make life easier for those struggling with chronic kidney failure.
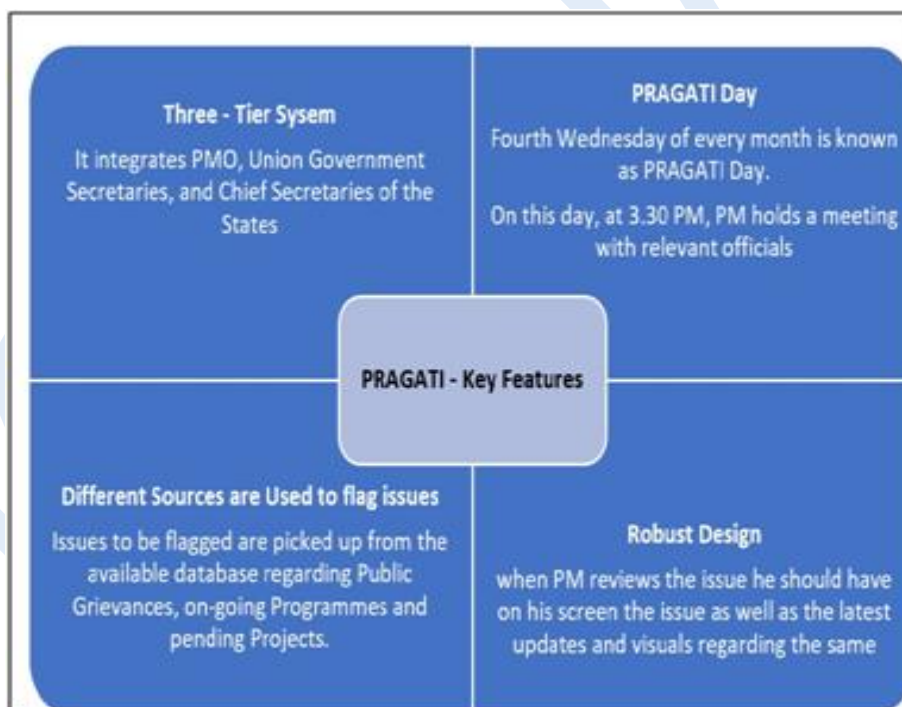
MISCELLANEOUS

❖ PRAGATI

Why in News: Prime Minister Modi chaired the 38thPRAGATI meeting in which eight projects were reviewed. These projects pertained to seven states viz. Odisha, Andhra Pradesh, Bihar, Jharkhand, Madhya Pradesh, Maharashtra and Haryana.

PRAGATI

- Launched in 2015, PRAGATI stands for PRo-Active Governance And Timely Implementation.
- It is an ICT based multi-purpose, multi-modal platform.
- It uniquely bundles three latest technologies -Digital data management, video-conferencing and geo-spatial technology.

PRAGATI - Key Features

Three - Tier Sysem

It integrates PMO, Union Government Secretaries, and Chief Secretaries of the States

PRAGATI Day

Fourth Wednesday of every month is known as PRAGATI Day.

On this day, at 3.30 PM, PM holds a meeting with relevant officials

Different Sources are Used to flag issues

Issues to be flagged are picked up from the available database regarding Public Grievances, on-going Programmes and pending Projects.

Robust Design

when PM reviews the issue he should have on his screen the issue as well as the latest updates and visuals regarding the same

Objective

- Addressing common man's grievances.
- Monitoring and reviewing important programs and projects.
- For these purposes, programs and projects of the central Govt. as well as projects flagged by State Governments are included.

Benefits

- Address the issue of trust deficit with the citizens – Its grievance redressal mechanism generates trust among common citizens.
- Promote cooperative federalism – The platform brings on one stage the Secretaries of the Government of India and the Chief Secretaries of the States.
- Fosters Growth– Delayed projects create a lot of stress on the economy in the form of Non-Performing Assets and escalating project costs.
- Through timely review and monitoring, the critical bottlenecks of projects are addressed.
- Promotes transparency and accountability - The decisions/minutes of the meetings are uploaded on the PRAGATI portal and are available in the public domain.
- The progress of the decisions is monitored by the Project Monitoring Group/PMO through the portal.

➢ Antarctic Treaty System

Why in News: The Union Minister Union Minister of State for Science & Technology recently addressed the 30th anniversary of the signing of the Protocol on Environmental Protection (Madrid Protocol) of the Antarctic Treaty System. He said that India is committed to curtail carbon emissions in the Antarctic atmosphere.

The Antarctic Treaty System

The Antarctic Treaty and related agreements, collectively known as the Antarctic Treaty System (ATS), are the whole complex of arrangements made for the purpose of regulating relations among states in the Antarctic.

Major components of the ATS include:

- Antarctic Treaty (1959)
- Convention for the Conservation of Antarctic Seals (1972)
- Convention on the Conservation of Antarctic Marine Living Resources (1980)
- Protocol on Environmental Protection to the Antarctic Treaty (1991)

Antarctic Treaty: The Antarctic Treaty was signed in Washington D.C. in December, 1959 and came into force in June, 1961.

Objective: To ensure "in the interests of all mankind that Antarctic shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord."

In order to achieve this goal, the Antarctic Treaty:

- Prohibits military activity, except in support of science
- Prohibits nuclear explosions and the disposal of nuclear waste
- Promotes scientific research and the exchange of data
- Holds all territorial claims in abeyance.

The Antarctic Treaty is a legally binding agreement. The Treaty applies to the area south of 60° South Latitude, including all ice shelves and islands.

Membership

The original signatories were the 12 countries active in Antarctic during the International Geophysical Year (IGY) of 1957–58: Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the Soviet Union, the United Kingdom, and the United States. Currently 54 member states are signatories to the Antarctic Treaty.

India signed the treaty in 1983. The Antarctic Treaty Consultative Meeting (ATCM) is held annually.

Headquarters: Buenos Aires, Argentina

The Madrid Protocol

- The Protocol on Environmental Protection to the Antarctic Treaty was signed in Madrid in October, 1991 and entered into force in 1998.
- The Madrid Protocol is a part of the ATS.

It harmonized and expanded on a range of earlier provisions relating to protection of the Antarctic environment. The Parties to the Protocol commit to comprehensively protect the environment of the Antarctic region and dependent and associated ecosystems.

The Protocol

- Designates Antarctic as a 'natural reserve, devoted to peace and science
- Establishes environmental principles that must be a fundamental consideration in the planning and conduct of all activities
- Prohibits mining indefinitely
- Requires that all proposed activities must be subject to a prior assessment of their environmental impacts
- Establishes the Committee for Environmental Protection(CEP), to advice and formulate recommendations to the Antarctic Treaty Parties on implementation of the Protocol

- Requires the development of contingency plans to respond to environmental emergencies.

Parties to the Protocol

- 42 member states (including India) are parties to the Madrid Protocol to the Antarctic Treaty.
- The Committee for Environmental Protection meets every year in conjunction with the Antarctic Treaty Consultative Meeting.

News Update

- Union Minister Dr Jitendra Singh was virtually addressing the International Conference commemorating the signing of the Madrid Protocol on Environmental Protection to the Antarctic Treaty.
- He said that India is committed to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems, and the designation of Antarctic as a natural reserve devoted to peace and science.
- He said that the choice of Combined Heat and Power (CHP) for Bharati station to reduce carbon emissions in the Antarctic also promotes India's pledge to protect the environment.
- CHP is an energy efficient technology that generates electricity and captures the heat that would otherwise be wasted to provide useful thermal energy.

India's Research Stations in Antarctic: India currently has two active research stations in Antarctic:

- Maitri (commissioned in 1989)
- Bharati (commissioned in 2012)

➢ **UNICEF's THE STATE OF THW WORLD's Children 2021**

Why in News: UNICEF's global flagship publication – The State of the World's Children 2021, has been released.

Title of The State of the World's Children 2021 report– "On My Mind: promoting, protecting and caring for children's mental health". The report details the significant impact of COVID-19.

➢ **NOBLE PRIZE FOR PHYSICS**

- The 2021 Nobel Prize for Physics has been awarded jointly to Syukuro Manabe, Klaus Hasselmann and Giorgio Parisi for their groundbreaking contributions to human understanding of complex physical systems and predicting their long-term behaviour.
- The weather and climate phenomena - systems with a very high degree of randomness - are examples of complex systems.

MANABE'S CLIMATE MODELS

Syukuro Manabe was the first researcher to explore the interaction between radiation balance and the vertical transport of air masses due to convection, also accounting for the heat contributed by the water cycle.

ATMOSPHERE

Incoming solar radiation

Infrared heat radiation

Cold air

Hot air + latent heat

Source: nobelprize.org

Infrared radiation from the ground is partially absorbed in the atmosphere, warming the air and the ground, while some radiated out into space.

Hot air is lighter than cold air, so it rises through convection. It also carries water vapour, which is a powerful greenhouse gas. Farther up, cloud drops form, releasing the latent heat stored in the water vapour.

**Nobel Prizes given for research related to Climate Change**

- 2021 Nobel Prize for Physics: This is the first-time climate scientists have been awarded the Physics Nobel. Therefore, it is being seen as an acknowledgment of the importance that climate science holds in today's world.
- The Intergovernmental Panel on Climate Change (IPCC) - Peace Nobel - 2007: This is an acknowledgement of the IPCC's efforts in creating awareness for the fight against climate change.
- Paul Crutzen - Chemistry Nobel - 1995: For his work on the ozone layer.

The Winners of 2021 Nobel Prize for Physics and their contributions:

- Syukuro Manabe and Klaus Hasselmann: They have been jointly awarded one half of the prize for the physical modelling of Earth's climate, quantifying variability and reliably predicting global warming.
- Syukuro Manabe: Manabe published a paper (1967), which was the first description of the processes of global warming.
- Manabe is known as the father of climate modeling, as he is credited for creating the first climate model and the present sophisticated models crucial to climate science, trace their origin to Manabe's model.
- Manabe was also instrumental in developing the first coupled model, in which ocean and atmospheric interactions are modeled together

Klaus Hasselmann:

- Hasselmann is an oceanographer who ventured into climate science.
- Hasselmann enabled the field of attribution science (likelihood or severity of a particular event happening today).
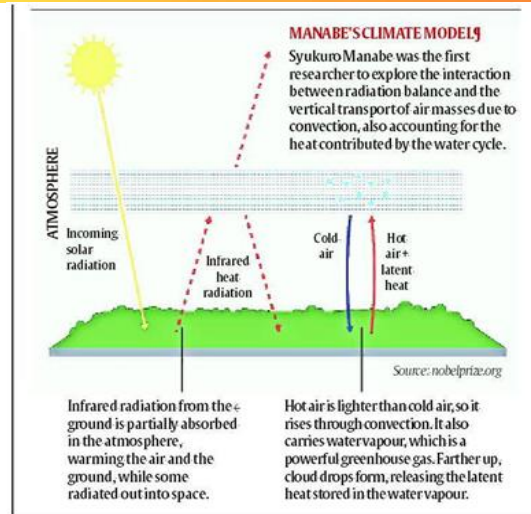
His work on detecting specific signatures or fingerprints on climate phenomena has been best known, which has helped scientists to determine if these have arisen from natural processes or human activities. The sixth assessment report of the IPCC therefore clearly states that human activities are the cause of climate change.

Both Manabe and Hasselmann contributed to the first and third assessment reports of the IPCC while Hasselmann was also the author of the second assessment report.

Giorgio Parisi: He has been awarded the other half for the discovery of the interplay of disorder and fluctuations in physical systems from atomic to planetary scales.

- Significance of Nobel Prize going to climate scientists: Will raise public awareness: Today, climate change is humanity's greatest crisis. Sadly, some people and governments are still unconvinced of reality. However, it will alter soon with such recognition.
- Will mainstream climate science: Until recently, even in scientific circles, climate science was not considered important. This Nobel Prize is likely to contribute to a wider integration of climate science, with more people believing in climate science.

(NOTE: KINDLY FOLLOW WEEKLY UPDATES TOO ALONG THIS MAGAZINE)